



SUBSTITUTE SEQUENCE LISTING

<110> Chiaur, D.
Pagano, M.
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<120> METHODS TO IDENTIFY COMPOUNDS USEFUL FOR THE TREATMENT
OF PROLIFERATIVE AND DIFFERENTIATIVE DISORDERS

<130> 5914-099-999

<140> US/10/652,928

<141> 2003-08-28

<150> US/09/385,219A

<151> 1999-08-27

<150> 60/098,355

<151> 1998-08-28

<150> 60/118,568

<151> 1999-02-03

<150> 60/124,449

<151> 1999-03-15

<160> 100

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 2151

<212> DNA

<213> Homo sapiens

<220>

<223> Nucleotide sequence of human F-box protein FBP1/Beta-TRCP1

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aattcactta	gacagacata	caacagctgt	gccagactct	gcttaaacca	agaaacagta	240
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<210> 2

<211> 569

<212> PRT

<213> Homo sapiens

<220>

<223> Amino Acid sequence of human F-box protein FBP1/Beta-TRCP1

<400> 2

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          20          25          30
Ile Ile Pro Glu Lys Asn Ser Leu Arg Gln Thr Tyr Asn Ser Cys Ala
          35          40          45
Arg Leu Cys Leu Asn Gln Glu Thr Val Cys Leu Ala Ser Thr Ala Met
          50          55          60
Lys Thr Glu Asn Cys Val Ala Lys Thr Lys Leu Ala Asn Gly Thr Ser
          65          70          75          80
Ser Met Ile Val Pro Lys Gln Arg Lys Leu Ser Ala Ser Tyr Glu Lys
          85          90          95
Glu Lys Glu Leu Cys Val Lys Tyr Phe Glu Gln Trp Ser Glu Ser Asp
          100          105          110
Gln Val Glu Phe Val Glu His Leu Ile Ser Gln Met Cys His Tyr Gln
          115          120          125
His Gly His Ile Asn Ser Tyr Leu Lys Pro Met Leu Gln Arg Asp Phe
          130          135          140
Ile Thr Ala Leu Pro Ala Arg Gly Leu Asp His Ile Ala Glu Asn Ile
          145          150          155          160
Leu Ser Tyr Leu Asp Ala Lys Ser Leu Cys Ala Ala Glu Leu Val Cys
          165          170          175
Lys Glu Trp Tyr Arg Val Thr Ser Asp Gly Met Leu Trp Lys Lys Leu
          180          185          190
Ile Glu Arg Met Val Arg Thr Asp Ser Leu Trp Arg Gly Leu Ala Glu
          195          200          205
Arg Arg Gly Trp Gly Gln Tyr Leu Phe Lys Asn Lys Pro Pro Asp Gly
          210          215          220
Asn Ala Pro Pro Asn Ser Phe Tyr Arg Ala Leu Tyr Pro Lys Ile Ile
          225          230          235          240
Gln Asp Ile Glu Thr Ile Glu Ser Asn Trp Arg Cys Gly Arg His Ser
          245          250          255
Leu Gln Arg Ile His Cys Arg Ser Glu Thr Ser Lys Gly Val Tyr Cys
          260          265          270
Leu Gln Tyr Asp Asp Gln Lys Ile Val Ser Gly Leu Arg Asp Asn Thr
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305					310					315					320
Ile	Thr	Gly	Ser	Ser	Asp	Ser	Thr	Val	Arg	Val	Trp	Asp	Val	Asn	Thr
				325					330					335	
Gly	Glu	Met	Leu	Asn	Thr	Leu	Ile	His	His	Cys	Glu	Ala	Val	Leu	His
			340					345					350		
Leu	Arg	Phe	Asn	Asn	Gly	Met	Met	Val	Thr	Cys	Ser	Lys	Asp	Arg	Ser
		355					360					365			
Ile	Ala	Val	Trp	Asp	Met	Ala	Ser	Pro	Thr	Asp	Ile	Thr	Leu	Arg	Arg
	370					375					380				
Val	Leu	Val	Gly	His	Arg	Ala	Ala	Val	Asn	Val	Val	Asp	Phe	Asp	Asp
385					390					395					400
Lys	Tyr	Ile	Val	Ser	Ala	Ser	Gly	Asp	Arg	Thr	Ile	Lys	Val	Trp	Asn
				405					410					415	
Thr	Ser	Thr	Cys	Glu	Phe	Val	Arg	Thr	Leu	Asn	Gly	His	Lys	Arg	Gly
			420					425					430		
Ile	Ala	Cys	Leu	Gln	Tyr	Arg	Asp	Arg	Leu	Val	Val	Ser	Gly	Ser	Ser
		435					440					445			
Asp	Asn	Thr	Ile	Arg	Leu	Trp	Asp	Ile	Glu	Cys	Gly	Ala	Cys	Leu	Arg
	450					455					460				
Val	Leu	Glu	Gly	His	Glu	Glu	Leu	Val	Arg	Cys	Ile	Arg	Phe	Asp	Asn
465					470					475					480
Lys	Arg	Ile	Val	Ser	Gly	Ala	Tyr	Asp	Gly	Lys	Ile	Lys	Val	Trp	Asp
				485					490					495	
Leu	Val	Ala	Ala	Leu	Asp	Pro	Arg	Ala	Pro	Ala	Gly	Thr	Leu	Cys	Leu
			500					505					510		
Arg	Thr	Leu	Val	Glu	His	Ser	Gly	Arg	Val	Phe	Arg	Leu	Gln	Phe	Asp
		515					520					525			
Glu	Phe	Gln	Ile	Val	Ser	Ser	Ser	His	Asp	Asp	Thr	Ile	Leu	Ile	Trp
	530					535					540				
Asp	Phe	Leu	Asn	Asp	Pro	Ala	Ala	Gln	Ala	Glu	Pro	Pro	Arg	Ser	Pro
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Ser	Arg	Thr	Tyr	Thr	Tyr	Ile	Ser	Arg							
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<210> 3

<211> 1476

<212> DNA

<213> Homo sapiens

<220>

<223> Nucleotide sequence of human F-box protein FBP2

<400> 3

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ctcaggcatc	tctccaataa	cctagagact	ctcctcaagc	gggacttcct	caaactcctt	180
cccctggagc	tcagttttta	tttgtttaaaa	tggtctcgatc	ctcagacttt	actcacatgc	240
tgctctcgtct	ctaaacagtg	gaataagggtg	ataagtgcct	gtacagaggt	gtggcagact	300
gcatgtaaaa	atttgggctg	gcagatagat	gattctgttc	aggacgcttt	gcaactggaag	360
aagggtttatt	tgaaggctat	tttgagaatg	aagcaactgg	aggaccatga	agcctttgaa	420
acctcgtcat	taattggaca	cagtgccaga	gtgtatgcac	tttactacaa	agatggactt	480
ctctgtacag	ggtcagatga	cttgtctgca	aagctgtggg	atgtgagcac	agggcagtgc	540
gtttatggca	tccagaccca	cacttggtgca	gcggtgaagt	ttgatgaaca	gaagcttggtg	600
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cacttttcggg	ggcacacggg	ggcgggtattt	agcgtggact	acaatgatga	actggatatc	720
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ctgaacacac	tcaccgggca	cacggaatgg	gtcaccaagg	tagttttgca	gaagtgcaaa	840
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tgtagttcag cacttgggtct ctaccagtgg gactttgcca gttatgatat tctcagggtc 1080
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<210> 4

<211> 422

<212> PRT

<213> Homo sapiens

<220>

<223> Amino Acid sequence of human F-box protein FBP2

<400> 4

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 20          25          30
Ile Ser Leu Ser Gly Ala Val Gln Leu Arg His Leu Ser Asn Asn Leu
 35          40          45
Glu Thr Leu Leu Lys Arg Asp Phe Leu Lys Leu Leu Pro Leu Glu Leu
 50          55          60
Ser Phe Tyr Leu Leu Lys Trp Leu Asp Pro Gln Thr Leu Leu Thr Cys
 65          70          75          80
Cys Leu Val Ser Lys Gln Trp Asn Lys Val Ile Ser Ala Cys Thr Glu
 85          90          95
Val Trp Gln Thr Ala Cys Lys Asn Leu Gly Trp Gln Ile Asp Asp Ser
100          105          110
Val Gln Asp Ala Leu His Trp Lys Lys Val Tyr Leu Lys Ala Ile Leu
115          120          125
Arg Met Lys Gln Leu Glu Asp His Glu Ala Phe Glu Thr Ser Ser Leu
130          135          140
Ile Gly His Ser Ala Arg Val Tyr Ala Leu Tyr Tyr Lys Asp Gly Leu
145          150          155          160
Leu Cys Thr Gly Ser Asp Asp Leu Ser Ala Lys Leu Trp Asp Val Ser
165          170          175
Thr Gly Gln Cys Val Tyr Gly Ile Gln Thr His Thr Cys Ala Ala Val
180          185          190
Lys Phe Asp Glu Gln Lys Leu Val Thr Gly Ser Phe Asp Asn Thr Val
195          200          205
Ala Cys Trp Glu Trp Ser Ser Gly Ala Arg Thr Gln His Phe Arg Gly
210          215          220
His Thr Gly Ala Val Phe Ser Val Asp Tyr Asn Asp Glu Leu Asp Ile
225          230          235          240
Leu Val Ser Gly Ser Ala Asp Phe Thr Val Lys Val Trp Ala Leu Ser
245          250          255
Ala Gly Thr Cys Leu Asn Thr Leu Thr Gly His Thr Glu Trp Val Thr
260          265          270
Lys Val Val Leu Gln Lys Cys Lys Val Lys Ser Leu Leu His Ser Pro
275          280          285
Gly Asp Tyr Ile Leu Leu Ser Ala Asp Lys Tyr Glu Ile Lys Ile Trp
290          295          300
Pro Ile Gly Arg Glu Ile Asn Cys Lys Cys Leu Lys Thr Leu Ser Val
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Ser Glu Asp Arg Ser Ile Cys Leu Gln Pro Arg Leu His Phe Asp Gly

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				325						330					335				
Lys	Tyr	Ile	Val	Cys	Ser	Ser	Ala	Leu	Gly	Leu	Tyr	Gln	Trp	Asp	Phe				
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Ala	Ser	Tyr	Asp	Ile	Leu	Arg	Val	Ile	Lys	Thr	Pro	Glu	Ile	Ala	Asn				
		355					360					365							
Leu	Ala	Leu	Leu	Gly	Phe	Gly	Asp	Ile	Phe	Ala	Leu	Leu	Phe	Asp	Asn				
	370					375					380								
Arg	Tyr	Leu	Tyr	Ile	Met	Asp	Leu	Arg	Thr	Glu	Ser	Leu	Ile	Ser	Arg				
385					390					395					400				
Trp	Pro	Leu	Pro	Glu	Tyr	Arg	Glu	Ser	Lys	Arg	Gly	Ser	Ser	Phe	Leu				
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Ala	Gly	Glu	His	Pro	Gly														
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<210> 5

<211> 1407

<212> DNA

<213> Homo sapiens

<220>

<223> Nucleotide sequence of human F-box protein FBP3a

<400> 5

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1407

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<210> 6

<211> 428

<212> PRT

<213> Homo sapeins

<220>

<223> Amino acid sequence of human F-box protein FBP3a

<400> 6

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Thr	Ala	Glu	Lys	Ser	Lys	Lys	Leu	Arg	Thr	Thr	Asn	Glu	His	Ser	Gln				


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gatagggttg cgcgtacgac ctcccgggag gaggtggatg aggcggccag caccctgacg 180
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<210> 8

<211> 472

<212> PRT

<213> Homo sapiens

<220>

<223> Amino acid sequence of human F-box protein FBP4

<400> 8

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Thr Phe Trp Gln Ser Val Ser Lys Asp Arg Val Ala Arg Thr Thr Ser
 35          40          45
Arg Glu Glu Val Asp Glu Ala Ser Thr Leu Thr Arg Leu Pro Ile
 50          55          60
Asp Val Gln Leu Tyr Ile Leu Ser Phe Leu Ser Pro His Asp Leu Cys
 65          70          75          80
Gln Leu Gly Ser Thr Asn His Tyr Trp Asn Glu Thr Val Arg Asn Pro
 85          90          95
Ile Leu Trp Arg Tyr Phe Leu Leu Arg Asp Leu Pro Ser Trp Ser Ser
100          105          110
Val Asp Trp Lys Ser Leu Pro Tyr Leu Gln Ile Leu Lys Lys Pro Ile
115          120          125
Ser Glu Val Ser Asp Gly Ala Phe Phe Asp Tyr Met Ala Val Tyr Leu
130          135          140
Met Cys Cys Pro Tyr Thr Arg Arg Ala Ser Lys Ser Ser Arg Pro Met
145          150          155          160
Tyr Gly Ala Val Thr Ser Phe Leu His Ser Leu Ile Ile Pro Asn Glu
165          170          175
Pro Arg Phe Ala Leu Phe Gly Pro Arg Leu Glu Gln Leu Asn Thr Ser
180          185          190
Leu Val Leu Ser Leu Leu Ser Ser Glu Glu Leu Cys Pro Thr Ala Gly
195          200          205

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Leu Pro Gln Arg Gln Ile Asp Gly Ile Gly Ser Gly Val Asn Phe Gln
 210 215 220
 Leu Asn Asn Gln His Lys Phe Asn Ile Leu Ile Leu Tyr Ser Thr Thr
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 Arg Lys Glu Arg Asp Arg Ala Arg Glu Glu His Thr Ser Ala Val Asn
 245 250 255
 Lys Met Phe Ser Arg His Asn Glu Gly Asp Asp Arg Pro Gly Ser Arg
 260 265 270
 Tyr Ser Val Ile Pro Gln Ile Gln Lys Leu Cys Glu Val Val Asp Gly
 275 280 285
 Phe Ile Tyr Val Ala Asn Ala Glu Ala His Lys Arg His Glu Trp Gln
 290 295 300
 Asp Glu Phe Ser His Ile Met Ala Met Thr Asp Pro Ala Phe Gly Ser
 305 310 315 320
 Ser Gly Arg Pro Leu Leu Val Leu Ser Cys Ile Ser Gln Gly Asp Val
 325 330 335
 Lys Arg Met Pro Cys Phe Tyr Leu Ala His Glu Leu His Leu Asn Leu
 340 345 350
 Leu Asn His Pro Trp Leu Val Gln Asp Thr Glu Ala Glu Thr Leu Thr
 355 360 365
 Gly Phe Leu Asn Gly Ile Glu Trp Ile Leu Glu Glu Val Glu Ser Lys
 370 375 380
 Arg Ala Arg Phe Ser Phe Gln Ile Leu Gly Thr Glu Thr Ile Asn Leu
 385 390 395 400
 Leu Leu Arg Ser Cys Glu Tyr Leu Leu Ser Gln Pro Thr Leu Ser Cys
 405 410 415
 Leu Phe Ala Asp Arg Leu Ser Phe Gly Gln Leu Leu Leu Cys Phe Leu
 420 425 430
 Tyr Tyr Phe Tyr Phe Leu Pro Ile Asn Tyr Lys Lys Arg Val Ser Val
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<210> 9
 <211> 2076
 <212> DNA
 <213> Homo sapiens

<220>
 <223> Nucleotide sequence of human F-box protein FBP5/EMI1

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<210> 10

<211> 447

<212> PRT

<213> Homo sapiens

<220>

<223> Amino acid sequence of human F-box protein FBP5/EMI1

<400> 10

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Cys Asp Phe Asn Cys Asn His Val His Ser Gly Leu Lys Leu Val Lys
50          55          60
Pro Asp Asp Ile Gly Arg Leu Val Ser Tyr Thr Pro Ala Tyr Leu Glu
65          70          75          80
Gly Ser Cys Lys Asp Cys Ile Lys Asp Tyr Glu Arg Leu Ser Cys Ile
85          90          95
Gly Ser Pro Ile Val Ser Pro Arg Ile Val Gln Leu Glu Thr Glu Ser
100         105         110
Lys Arg Leu His Asn Lys Glu Asn Gln His Val Gln Gln Thr Leu Asn
115         120         125
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Ser Gly Tyr Ser Ser Phe Ser Leu Gln Ser Gly Leu Ser Glu His Glu
145         150         155         160
Glu Gly Ser Leu Leu Glu Glu Asn Phe Gly Asp Ser Leu Gln Ser Cys
165         170         175
Leu Leu Gln Ile Gln Ser Pro Asp Gln Tyr Pro Asn Lys Asn Leu Leu
180         185         190
Pro Val Leu His Phe Glu Lys Val Val Cys Ser Thr Leu Lys Lys Asn
195         200         205
Ala Lys Arg Asn Pro Lys Val Asp Arg Glu Met Leu Lys Glu Ile Ile
210         215         220
Ala Arg Gly Asn Phe Arg Leu Gln Asn Ile Ile Gly Arg Lys Met Gly
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Leu Glu Cys Val Asp Ile Leu Ser Glu Leu Phe Arg Arg Gly Leu Arg
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Phe	Arg	Thr	Pro	Leu	Ala	Ser	Val	Gln	Lys	Ser	Ala	Ala	Gln	Thr	Ser
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385					390					395					400
Cys	Gly	Phe	Asp	Tyr	Cys	Thr	Lys	Cys	Leu	Cys	Asn	Tyr	His	Thr	Thr
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<210> 11

<211> 1535

<212> DNA

<213> Homo sapiens

<220>

<223> Nucleotide sequence of human F-box protein FBP6

<400> 11

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<210> 12
 <211> 338
 <212> PRT
 <213> Homo sapiens

<220>

<223> Amino acid sequence of human F-box protein FBP6

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Ile	Leu	Leu	Glu	Leu	Phe	Thr	His	Val	Pro	Ala	Arg	Gln	Leu	Leu	Leu
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Asn	Cys	Arg	Leu	Val	Cys	Ser	Leu	Trp	Arg	Asp	Leu	Ile	Asp	Leu	Leu
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Gly	Trp	Tyr	Gly	Pro	Arg	Val	Thr	Asn	Ser	Ser	Ile	Val	Val	Ser	Pro
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Lys	Met	Thr	Arg	Asn	Gln	Ala	Ser	Ser	Glu	Ala	Gln	Pro	Gly	Gln	Lys
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His	Gly	Gln	Glu	Glu	Ala	Ala	Gln	Ser	Pro	Tyr	Gly	Ala	Val	Val	Gln
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<210> 13
 <211> 1763
 <212> DNA
 <213> Homo sapiens

<220>

<223> Nucleotide sequence of human F-box protein FBP7

<400> 13

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<210> 14

<211> 482

<212> PRT

<213> Homo sapiens

<220>

<223> Amino acid sequence of human F-box protein FBP7

<400> 14

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Leu Ile Cys Leu Ile Leu His Asp Asp Ile Pro Pro Pro Asn Ile Pro
          35           40           45
Ser Ser Thr Asp Ser Glu His Ser Ser Leu Gln Asn Asn Glu Gln Pro
          50           55           60
Ser Leu Ala Thr Ser Ser Asn Gln Thr Ser Ile Gln Asp Glu Gln Pro
          65           70           75           80
Ser Asp Ser Phe Gln Gly Gln Ala Ala Gln Ser Gly Val Trp Asn Asp
          85           90           95
Asp Ser Met Leu Gly Pro Ser Gln Asn Phe Glu Ala Glu Ser Ile Gln
          100          105          110
Asp Asn Ala His Met Ala Glu Gly Thr Gly Phe Tyr Pro Ser Glu Pro
          115          120          125
Leu Leu Cys Ser Glu Ser Val Glu Gly Gln Val Pro His Ser Leu Glu
          130          135          140

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 180 185 190
 Val Tyr Lys Leu Gln Tyr Met His Leu Cys Glu Gly Ser Ser Ala
 195 200 205
 Thr Leu Thr Cys Val Pro Leu Gly Asn Leu Ile Val Val Asn Ala Thr
 210 215 220
 Leu Lys Ile Asn Asn Glu Ile Arg Ser Val Lys Arg Leu Gln Leu Leu
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 Pro Glu Ser Phe Ile Cys Lys Glu Lys Leu Gly Glu Asn Val Ala Asn
 245 250 255
 Ile Tyr Lys Asp Leu Gln Lys Leu Ser Arg Leu Phe Lys Asp Gln Leu
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 Val Tyr Pro Leu Leu Ala Phe Thr Arg Gln Ala Leu Asn Leu Pro Asn
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 Val Phe Gly Leu Val Val Leu Pro Leu Glu Leu Lys Leu Arg Ile Phe
 290 295 300
 Arg Leu Leu Asp Val Arg Ser Val Leu Ser Leu Ser Ala Val Cys Arg
 305 310 315 320
 Asp Leu Phe Thr Ala Ser Asn Asp Pro Leu Trp Arg Phe Leu Tyr
 325 330 335
 Leu Arg Asp Phe Arg Asp Asn Thr Val Arg Val Gln Asp Thr Asp Trp
 340 345 350
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 Gly Arg Phe Val Leu Leu Leu Pro Ser Ser Thr His Thr Ile Pro Phe
 370 375 380
 Tyr Pro Asn Pro Leu His Pro Arg Pro Phe Pro Ser Ser Arg Leu Pro
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 405 410 415
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 435 440 445
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<210> 15

<211> 43

<212> PRT

<213> Homo sapiens

<220>

<223> F-box motif amino acid residues in the human F-box protein FBP1

<400> 15

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<210> 16
 <211> 40
 <212> PRT
 <213> Homo sapiens

<220>
 <223> F-box motif amino acid residues in the human F-box protein FBP2

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 20 25 30
 Ser Ala Cys Thr Glu Val Trp Gln
 35 40

<210> 17
 <211> 39
 <212> PRT
 <213> Homo sapiens

<220>
 <223> F-box motif amino acid residues in the human F-box protein FBP3

<400> 17
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<210> 18
 <211> 39
 <212> PRT
 <213> Homo sapiens

<220>
 <223> F-box motif amino acid residues in the human F-box protein FBP4

<400> 18
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<210> 19
 <211> 39
 <212> PRT
 <213> Homo sapiens

<220>
 <223> F-box motif amino acid residues in the human F-box protein FBP5

<400> 19
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<210> 20
 <211> 40
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<220>
 <223> F-box motif amino acid residues in the human F-box protein FBP6

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<210> 21
 <211> 39
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<220>
 <223> F-box motif amino acid residues in the human F-box protein FBP7

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 35

<210> 22
 <211> 39
 <212> PRT
 <213> Homo sapiens

<220>
 <223> F-box motif amino acid residues in the human F-box protein SKP2

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 20 25 30
 Ser Asp Glu Ser Leu Trp Gln
 35

<210> 23
 <211> 1323
 <212> DNA
 <213> Homo sapiens

<220>

<223> Nucleotide sequence of human F-box protein FBP3b

<400> 23

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<210> 24

<211> 434

<212> PRT

<213> Homo sapiens

<220>

<223> Amino Acid sequence of human F-box protein FBP3b

<400> 24

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 20          25          30
Thr His Thr His Thr Val Leu Leu Asp Trp Gly Ser Leu Pro His His
 35          40          45
Val Val Leu Gln Ile Phe Gln Tyr Leu Pro Leu Leu Asp Arg Ala Cys
 50          55          60
Ala Ser Ser Val Cys Arg Arg Trp Asn Glu Val Phe His Ile Ser Asp
 65          70          75          80
Leu Trp Arg Lys Phe Glu Phe Glu Leu Asn Gln Ser Ala Thr Ser Ser
 85          90          95
Phe Lys Ser Thr His Pro Asp Leu Ile Gln Gln Ile Ile Lys Lys His
100          105          110
Phe Ala His Leu Gln Tyr Val Ser Phe Lys Val Asp Ser Ser Ala Glu
115          120          125
Ser Ala Glu Ala Ala Cys Asp Ile Leu Ser Gln Leu Val Asn Cys Ser
130          135          140
Ile Gln Thr Leu Gly Leu Ile Ser Thr Ala Lys Pro Ser Phe Met Asn
145          150          155          160
Val Ser Glu Ser His Phe Val Ser Ala Leu Thr Val Val Phe Ile Asn
165          170          175
Ser Lys Ser Leu Ser Ser Ile Lys Ile Glu Asp Thr Pro Val Asp Asp
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<210> 26
 <211> 634
 <212> PRT
 <213> Homo sapiens

<220>
 <221> VARIANT
 <222> 218,556,630
 <223> Xaa = unknown amino acid residue

<220>
 <223> Amino Acid sequence of human F-box protein FBP8

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<400> 26
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          20          25          30
Val Thr Ser Thr Gly Val Asp Lys Ser Leu Asn Gln Leu Leu His Gly
          35          40          45
Leu Gly Thr Ser Ser Arg Leu Ser His Phe Pro Phe Gly Lys Ser Pro
          50          55          60
Pro Arg Gly Gln Phe Val Ala Ala Ala Val Glu Ile Ala Gly Arg Ser
          65          70          75          80
Gly Leu Gln Met Gly Gln Gly Leu Trp Arg Val Val Arg Asn Gln Gln
          85          90          95
Leu Gln Gln Glu Gly Tyr Ser Glu Gln Gly Tyr Leu Thr Arg Glu Gln
          100          105          110
Ser Arg Arg Met Ala Ala Ser Asn Ile Ser Asn Thr Asn His Arg Lys
          115          120          125
Gln Val Gln Gly Gly Ile Asp Ile Tyr His Leu Leu Lys Ala Arg Lys
          130          135          140
Ser Lys Glu Gln Glu Gly Phe Ile Asn Leu Glu Met Leu Pro Pro Glu
          145          150          155          160
Leu Ser Phe Thr Ile Leu Ser Tyr Leu Asn Ala Thr Asp Leu Cys Leu
          165          170          175
Ala Ser Cys Val Trp Gln Asp Leu Ala Asn Asp Glu Leu Leu Trp Gln
          180          185          190
Gly Leu Cys Lys Ser Thr Trp Gly His Cys Ser Ile Tyr Asn Lys Asn
          195          200          205
Pro Pro Leu Gly Phe Ser Phe Arg Lys Xaa Tyr Met Gln Leu Asp Glu
          210          215          220
Gly Ser Leu Thr Phe Asn Ala Asn Pro Asp Glu Gly Val Asn Tyr Phe
          225          230          235          240
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<210> 28
<211> 621
<212> PRT
<213> Homo sapiens

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<220>
<223> Amino Acid sequence of human F-box protein FBP9

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<400> 28
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      20             25             30
Leu Pro Gly Glu Val Leu Glu Tyr Ile Leu Cys Cys Gly Ser Leu Thr
      35             40             45
Ala Ala Asp Ile Gly Arg Val Ser Ser Thr Cys Arg Arg Leu Arg Glu
      50             55             60
Leu Cys Gln Ser Ser Gly Lys Val Trp Lys Glu Gln Phe Arg Val Arg
      65             70             75             80
Trp Pro Ser Leu Met Lys His Tyr Ser Pro Thr Asp Tyr Val Asn Trp
      85             90             95
Leu Glu Glu Tyr Lys Val Arg Gln Lys Ala Gly Leu Glu Ala Arg Lys
      100            105            110
Ile Val Ala Ser Phe Ser Lys Arg Phe Phe Ser Glu His Val Pro Cys
      115            120            125
Asn Gly Phe Ser Asp Ile Glu Asn Leu Glu Gly Pro Glu Ile Phe Phe
      130            135            140
Glu Asp Glu Leu Val Cys Ile Leu Asn Met Glu Gly Arg Lys Ala Leu
      145            150            155            160
Thr Trp Lys Tyr Tyr Ala Lys Lys Ile Leu Tyr Tyr Leu Arg Gln Gln
      165            170            175
Lys Ile Leu Asn Asn Leu Lys Ala Phe Leu Gln Gln Pro Asp Asp Tyr
      180            185            190
Glu Ser Tyr Leu Glu Gly Ala Val Tyr Ile Asp Gln Tyr Cys Asn Pro
      195            200            205
Leu Ser Asp Ile Ser Leu Lys Asp Ile Gln Ala Gln Ile Asp Ser Ile
      210            215            220
Val Glu Leu Val Cys Lys Thr Leu Arg Gly Ile Asn Ser Arg His Pro
      225            230            235            240
Ser Leu Ala Phe Lys Ala Gly Glu Ser Ser Met Ile Met Glu Ile Glu
      245            250            255
Leu Gln Ser Gln Val Leu Asp Ala Met Asn Tyr Val Leu Tyr Asp Gln
      260            265            270
Leu Lys Phe Lys Gly Asn Arg Met Asp Tyr Tyr Asn Ala Leu Asn Leu
      275            280            285
Tyr Met His Gln Val Leu Ile Arg Arg Thr Gly Ile Pro Ile Ser Met
      290            295            300
Ser Leu Leu Tyr Leu Thr Ile Ala Arg Gln Leu Gly Val Pro Leu Glu
      305            310            315            320
Pro Val Asn Phe Pro Ser His Phe Leu Leu Arg Trp Cys Gln Gly Ala
      325            330            335
Glu Gly Ala Thr Leu Asp Ile Phe Asp Tyr Ile Tyr Ile Asp Ala Phe

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Leu	Gln	Arg	Met	Val	Gly	Asn	Leu	Leu	Ser	Leu	Gly	Lys	Arg	Glu	Gly		
385					390					395					400		
Ile	Asp	Gln	Ser	Tyr	Gln	Leu	Leu	Arg	Asp	Ser	Leu	Asp	Leu	Tyr	Leu		
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Ala	Met	Tyr	Pro	Asp	Gln	Val	Gln	Leu	Leu	Leu	Leu	Gln	Ala	Arg	Leu		
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Tyr	Phe	His	Leu	Gly	Ile	Trp	Pro	Glu	Lys	Val	Leu	Asp	Ile	Leu	Gln		
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Asn	Val	Leu	Val	Glu	Asp	Gly	Ser	Cys	Arg	Tyr	Ala	Ala	Gln	Glu	Asn		
545				550						555					560		
Leu	Glu	Tyr	Asn	Val	Glu	Pro	Gln	Glu	Ile	Ser	His	Pro	Asp	Val	Gly		
			565					570						575			
Arg	Tyr	Phe	Ser	Glu	Phe	Thr	Gly	Thr	His	Tyr	Ile	Pro	Asn	Ala	Glu		
			580					585					590				
Leu	Glu	Ile	Arg	Tyr	Pro	Glu	Asp	Leu	Glu	Phe	Val	Tyr	Glu	Thr	Val		
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<210> 29
 <211> 278
 <212> DNA
 <213> Homo sapiens

<220>
 <221> variation
 <222> 13,47,68,88, 270
 <223> n = a, g, c, or t

<220>
 <223> Nucleotide sequence of human F-box protein FBP10

<400> 29
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 tcccgggntc ctccgtagac ccgcgganac cttcgtgttg agtaacctgg cggaggtggt 120
 ggagcgtgtg ctcaccttcc tgcccgccaa ggcgttgctg cgggtggcct gcgtgtgccg 180
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<210> 30
 <211> 91
 <212> PRT
 <213> Homo sapiens

<220> .
 <221> VARIANT
 <222> 15,22,28,89
 <223> Xaa = unknown amino acid residue

<220>
 <223> Amino Acid sequence of human F-box protein FBP10

<400> 30
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 20 25 30
 Ser Asn Leu Ala Glu Val Val Glu Arg Val Leu Thr Phe Leu Pro Ala
 35 40 45
 Lys Ala Leu Leu Arg Val Ala Cys Val Cys Arg Leu Trp Arg Glu Cys
 50 55 60
 Val Arg Arg Val Leu Arg Thr His Arg Ser Val Thr Trp Ile Ser Ala
 65 70 75 80
 Gly Leu Ala Glu Ala Gly His Leu Xaa Gly His
 85 90

<210> 31
 <211> 592
 <212> DNA
 <213> Homo sapiens

<220>
 <223> Nucleotide sequence of human F-box protein FBP11

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<210> 32
 <211> 197
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Amino Acid sequence of human F-box protein FBP11

<400> 32
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 Pro Pro Gln Gln Gln Gln Gln Gln Pro Pro Pro Pro Pro Pro Pro
 35 40 45
 Pro Pro Pro Leu Pro Gln Glu Arg Asn Asn Val Gly Glu Arg Asp Asp

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Asp Val Pro Ala Asp Met Val Ala Glu Glu Ser Gly Pro Gly Ala Gln
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Asn Ser Pro Tyr Gln Leu Arg Arg Lys Thr Leu Leu Pro Lys Arg Thr
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      85              90              95
Ala Cys Pro Thr Lys Asn Ser Met Glu Gly Ala Ser Thr Ser Thr Thr
100
Glu Asn Phe Gly His Arg Ala Lys Arg Ala Arg Val Ser Gly Lys Ser
115
Gln Asp Leu Ser Ala Ala Pro Ala Glu Gln Tyr Leu Gln Glu Lys Leu
130
Pro Asp Glu Val Val Leu Lys Ile Phe Ser Tyr Leu Leu Glu Gln Asp
145
Leu Cys Arg Ala Ala Cys Val Cys Lys Arg Phe Ser Glu Leu Ala Asn
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Asp Pro Asn Leu Trp Lys Arg Leu Tyr Met Glu Val Phe Glu Tyr Thr
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Arg Pro Met Met His
195

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<210> 33
 <211> 537
 <212> DNA
 <213> Homo sapiens

<220>
 <223> Nucleotide sequence of human F-box protein FBP12

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<400> 33
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ctggcggcag ctgtgtctgg gttgcaccga gtgcccgcac cccaattggc ccaaccagcc 240
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atggaccaag aatgccttgg acttgagtc ttccatctgc ttttctctat tccgcgggag 360
gagggaaacga cgtaccctga gtgttgggcc aggccgtgag tttgacagcc tgggcagtgc 420
cttggccatg gccagcctgt atgaccgaat tgtgctcttc ccaggtgtgt acgaagagca 480
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<210> 34
 <211> 178
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Amino Acid sequence of human F-box protein FBP12

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<400> 34
Arg Pro Arg Pro Gly Leu Arg Gly Gly Arg Ala Pro Cys Glu Val Thr
1      5      10      15
Met Glu Ala Gly Gly Leu Pro Leu Glu Leu Trp Arg Met Ile Leu Ala
20      25      30
Tyr Leu His Leu Pro Asp Leu Gly Arg Cys Ser Leu Val Cys Arg Ala
35      40      45
Trp Tyr Glu Leu Ile Leu Ser Leu Asp Ser Thr Arg Trp Arg Gln Leu
50      55      60
Cys Leu Gly Cys Thr Glu Cys Arg His Pro Asn Trp Pro Asn Gln Pro
65      70      75      80
Asp Val Glu Pro Glu Ser Trp Arg Glu Ala Phe Lys Gln His Tyr Leu
85      90      95

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Ala	Ser	Lys	Thr	Trp	Thr	Lys	Asn	Ala	Leu	Asp	Leu	Glu	Ser	Ser	Ile
			100					105					110		
Cys	Phe	Ser	Leu	Phe	Arg	Arg	Arg	Arg	Glu	Arg	Arg	Thr	Leu	Ser	Val
		115					120					125			
Gly	Pro	Gly	Arg	Glu	Phe	Asp	Ser	Leu	Gly	Ser	Ala	Leu	Ala	Met	Ala
	130					135					140				
Ser	Leu	Tyr	Asp	Arg	Ile	Val	Leu	Phe	Pro	Gly	Val	Tyr	Glu	Glu	Gln
145					150					155					160
Gly	Glu	Ile	Ile	Leu	Lys	Val	Pro	Val	Glu	Ile	Val	Gly	Gln	Gly	Lys
				165					170					175	
Leu	Gly														

<210> 35
 <211> 751
 <212> DNA
 <213> Homo sapiens

<220>
 <223> Nucleotide sequence of human F-box protein FBP13

<400> 35
 gagaccgaga cggcgccgct gaccctagag tcgctgcca cccgatcccct gctcctcatc 60
 ttatcctttt tggactatcg ggatctaata aactgttggt atgtcagtcg aagattaagc 120
 cagctatcaa gtcgatgatcc gctgtggaga agacattgca aaaaataactg gctgatatact 180
 gaggaagaga aaacacagaa gaatcagtggt tggaaatctc tcttcataga tacttactct 240
 gatgtaggaa gatacattga ccattatgct gctattaaaa aggccctcggg aatgatctca 300
 agaaatatat ggagcccagg tgcctcggga tgggttttat ctctgaaaga ggggtgctcg 360
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 cgatgttcat accgaattca caatggacag aagttagttg gttcctgggg ttattgggaa 480
 gcatggcact gtctaatacac tatcgttctg aagatttggt agacgtcgat acagctgccg 540
 gagattccag cagagacagg gactgaaata ctgtctccct ttaacttttg catacatact 600
 ggtttgagtc agtacatagc agtggaaagct gcagagggtt gaaacaaaaa tgaagttttc 660
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 tgtataaatg gcatgcatta ggtattttca g 751

<210> 36
 <211> 247
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Amino Acid sequence of human F-box protein FBP13

<400> 36
 Glu Thr Glu Thr Ala Pro Leu Thr Leu Glu Ser Leu Pro Thr Asp Pro
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 Leu Leu Leu Ile Leu Ser Phe Leu Asp Tyr Arg Asp Leu Ile Asn Cys
 20 25 30
 Cys Tyr Val Ser Arg Arg Leu Ser Gln Leu Ser Ser His Asp Pro Leu
 35 40 45
 Trp Arg Arg His Cys Lys Lys Tyr Trp Leu Ile Ser Glu Glu Glu Lys
 50 55 60
 Thr Gln Lys Asn Gln Cys Trp Lys Ser Leu Phe Ile Asp Thr Tyr Ser
 65 70 75 80
 Asp Val Gly Arg Tyr Ile Asp His Tyr Ala Ile Lys Lys Ala Ser
 85 90 95
 Gly Met Ile Ser Arg Asn Ile Trp Ser Pro Gly Val Leu Gly Trp Val
 100 105 110

Leu	Ser	Leu	Lys	Glu	Gly	Cys	Ser	Arg	Gly	Arg	Pro	Arg	Cys	Cys	Gly
		115					120					125			
Ser	Ala	Asp	Trp	Ala	Ala	Ser	Phe	Leu	Asp	Asp	Tyr	Arg	Cys	Ser	Tyr
	130					135					140				
Arg	Ile	His	Asn	Gly	Gln	Lys	Leu	Val	Gly	Ser	Trp	Gly	Tyr	Trp	Glu
145					150					155					160
Ala	Trp	His	Cys	Leu	Ile	Thr	Ile	Val	Leu	Lys	Ile	Cys	Thr	Ser	Ile
				165					170					175	
Gln	Leu	Pro	Glu	Ile	Pro	Ala	Glu	Thr	Gly	Thr	Glu	Ile	Leu	Ser	Pro
			180				185						190		
Phe	Asn	Phe	Cys	Ile	His	Thr	Gly	Leu	Ser	Gln	Tyr	Ile	Ala	Val	Glu
	195						200					205			
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	210					215					220				
Glu	Arg	Val	Phe	Lys	Tyr	Gly	Ile	Lys	Met	Cys	Ser	Asp	Gly	Cys	Ile
225					230					235					240
Asn	Gly	Met	His	Val	Phe	Ser									
				245											

<210> 37
 <211> 368
 <212> DNA
 <213> Homo sapiens

<220>
 <221> variation
 <222> 45,329,332
 <223> n = a, c, g, or t

<220>
 <223> Nucleotide sequence of human F-box protein FBP14

<400> 37
 ggctccggtt tccggggccgg cgggtggcgg ctcaccatgc ccggaagca ccagcatttc 60
 caggaacctg aggtcggctg ctgcgggaaa tacttcctgt ttggcttcaa cattgtcttc 120
 tgggtgctgg gagccctgtt cctggctatc ggctctctgg cctgggggtga gaaggcggtt 180
 ctctcgaaca tctcagcgtt gacagatctg ggaggccttg accccgtgtg gcttggtttgt 240
 ggtagtgtga ggcgtcatgt cgggtgctggg ctttgctggg ctgcaattgg ggccctccgg 300
 gagaacacct tcctgctcaa gtttttctnc gngttcctcg gtctcatctt cttcctggag 360
 ctggcaac 368

<210> 38
 <211> 122
 <212> PRT
 <213> Homo sapiens

<220>
 <221> VARIANT
 <222> 110,111
 <223> Xaa = unknown amino acid residue

<220>
 <223> Amino Acid sequence of human F-box protein FBP14

<400> 38
 Gly Ser Gly Phe Arg Ala Gly Gly Trp Pro Leu Thr Met Pro Gly Lys
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 His Gln His Phe Gln Glu Pro Glu Val Gly Cys Cys Gly Lys Tyr Phe
 20 25 30
 Leu Phe Gly Phe Asn Ile Val Phe Trp Val Leu Gly Ala Leu Phe Leu
 35 40 45

115 120 125
 Tyr Phe Ala Ser Ser Phe Glu Trp Cys Arg Lys Ala Gln Val Ile Asp
 130 135 140
 Leu Gln Ala Glu Gly Tyr Trp Glu Glu Leu Leu Asp Thr Thr Gln Pro
 145 150 155 160
 Ala Ile Val Val Lys Asp Trp Tyr Ser Gly Arg Ser Asp Ala Gly Cys
 165 170 175
 Leu Tyr Glu Leu Thr Val Lys Leu Leu Ser Glu His Glu Asn Val Leu
 180 185 190
 Ala Glu Phe Ser Ser Gly Gln Val Ala Val Pro Gln Asp Ser Asp Gly
 195 200 205
 Gly Gly Trp Met Glu Ile Ser His Thr Phe Thr Asp Tyr Gly Pro Gly
 210 215 220
 Val Arg Phe Val Arg Phe Glu His Gly Gly Gln Gly Ser Val Tyr Trp
 225 230 235 240
 Lys Gly Trp Phe Gly Ala Arg Val Thr Asn Ser Ser Val Trp Val Glu
 245 250 255
 Pro

<210> 41
 <211> 957
 <212> DNA
 <213> Homo sapiens

<220>
 <223> Nucleotide sequence of human F-box protein FBP16

<400> 41
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 tgtggctcgg agcttggggg tgaagagaag aggggggaaag gaaatccgat ttccatccag 120
 ttgttcccc cagagctggg ggagcatatc atctcattcc tcccagtcag agaccttgtt 180
 gccctcgccc agacctgccg ctacttccac gaagtgtgcg atggggaagg cgtgtggaga 240
 cgcatctgtc gcagactcag tccgcgcctc caagatcagg acacgaaggg cctgtatttc 300
 caggcatattg gaggcgcgccc ccatgtgttc agcaagagcg tggccccctt gctagcccac 360
 ggctaccgcc gcttcttgcc caccaaggat cacgtcttca ttcttgacta cgtggggacc 420
 ctcttcttcc tcaaaaatgc cctgggtctcc accctcggcc agatgcagtg gaagcgggcc 480
 tgctcgctatg ttgtgttgtg tcgtggagcc aaggattttg cctcggaccc aaggtgtgac 540
 acagtttacc gtaaatacct ctacgtcttg gccactcggg agccgcagga agtgggtgggt 600
 accaccagca gccgggcctg tgactgtgtt gaggtctatc tgcagtctag tgggcagcgg 660
 gtcttcaaga tgacattcca ccactcaatg accttcaagc agatcgtgct ggttgggtcag 720
 gagaccacag gggtcttact gctcctcaca gaggaaggaa agatctactc tttggtagtg 780
 aatgagaccc agcttgacca gccacgctcc tacacgggtc agctggccct gaggaagggtg 840
 tcccactacc tgcctcacct gcgcgtggcc tgcattgactt ccaaccagag cagcacccctc 900
 tacgtcacag atcctattct gtgctcttgg ctacaaccac cttggcctgg tggatga 957

<210> 42
 <211> 318
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Amino Acid sequence of human F-box protein FBP16

<400> 42
 Met Gly Glu Lys Ala Val Pro Leu Leu Arg Arg Arg Arg Val Lys Arg
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 Ser Cys Pro Ser Cys Gly Ser Glu Leu Gly Val Glu Glu Lys Arg Gly
 20 25 30
 Lys Gly Asn Pro Ile Ser Ile Gln Leu Phe Pro Pro Glu Leu Val Glu


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gaggtgaact gtgtggattg caaagggggc atcatatcat ttggctccag ggacaggacg 1020
gccaaggtgt ggccttttggc ctcaggccag ctggggcagt gtttatacac catccagact 1080
gaagacaaaa tctggtctgt tgctatcagg ccattactca gctcttttgt gacagggacg 1140
gcttgtttgg ggcacttctc acccctgaaa atctgggacc tcaacagtgg gcagctgatg 1200
acacacttgg acagagactt tcccccaagg gctgggggtgc tggatgtcat atatgagtcc 1260
ccttttcgac tgctctcctg tggctatgac acctatgttc gctactggga ctgccgcacc 1320
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cagacagatg gcaaccactt gcttgccaca ggttcctcct tctatagcgt tgtacggctg 1440
tgggaccggc accaaagggc ctgcccgcac accttcccgc tgacgtcgac ccgcctcggc 1500
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ctccacgtcc tggatattca aaaccctga 1590

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<210> 44
 <211> 529
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Amino Acid sequence of human F-box protein FBP17

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<400> 44
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20     25     30
Asp Gly Glu Gly Gly Ser Gly Pro Gly Ala Glu Ala Gly Ala Arg Thr
35     40     45
Arg Pro Arg Glu Glu Ala Glu Gly Gly Gly Ser Val Glu Glu Gly Ala
50     55     60
Arg Gly Ile Ile Lys Gly Asp Glu Gly Ser Val Gly Ala Gly Lys Glu
65     70     75     80
Ala Gln Gly Arg Lys Tyr Gly Lys Glu Glu Trp Arg Val Arg Ala Arg
85     90     95
Arg Arg Glu Gly Ala Arg Pro Gly Arg Val Gln Gly Gln Gly Gly Gln
100    105    110
Val Trp Ala Tyr Ile Pro Gly Thr Gly Ala Ala Met Ala Ala Ala Ala
115    120    125
Arg Glu Glu Glu Glu Glu Ala Arg Glu Ser Ala Ala Cys Pro Ala
130    135    140
Ala Gly Pro Ala Leu Trp Arg Leu Pro Glu Val Leu Leu Leu His Met
145    150    155    160
Cys Ser Tyr Leu Asp Met Arg Ala Leu Gly Arg Leu Ala Gln Val Tyr
165    170    175
Arg Trp Leu Trp His Phe Thr Asn Cys Asp Leu Leu Arg Arg Gln Ile
180    185    190
Ala Trp Ala Ser Leu Asn Ser Gly Phe Thr Arg Leu Gly Thr Asn Leu
195    200    205
Met Thr Ser Val Pro Val Lys Val Ser Gln Asn Trp Ile Val Gly Cys
210    215    220
Cys Arg Glu Gly Ile Leu Leu Lys Trp Arg Cys Ser Gln Met Pro Trp
225    230    235    240
Met Gln Leu Glu Asp Asp Ala Leu Tyr Ile Ser Gln Ala Asn Phe Ile
245    250    255
Leu Ala Tyr Gln Phe Arg Pro Asp Gly Ala Ser Leu Asn Arg Gln Pro
260    265    270
Leu Gly Val Ser Ala Gly His Asp Glu Asp Val Cys His Phe Val Leu
275    280    285
Ala Thr Ser His Ile Val Ser Ala Gly Gly Asp Gly Lys Ile Gly Leu
290    295    300

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Gly Lys Ile His Ser Thr Phe Ala Ala Lys Tyr Trp Ala His Glu Gln
 305 310 315 320
 Glu Val Asn Cys Val Asp Cys Lys Gly Gly Ile Ile Ser Phe Gly Ser
 325 330 335
 Arg Asp Arg Thr Ala Lys Val Trp Pro Leu Ala Ser Gly Gln Leu Gly
 340 345 350
 Gln Cys Leu Tyr Thr Ile Gln Thr Glu Asp Gln Ile Trp Ser Val Ala
 355 360 365
 Ile Arg Pro Leu Leu Ser Ser Phe Val Thr Gly Thr Ala Cys Cys Gly
 370 375 380
 His Phe Ser Pro Leu Lys Ile Trp Asp Leu Asn Ser Gly Gln Leu Met
 385 390 395 400
 Thr His Leu Asp Arg Asp Phe Pro Pro Arg Ala Gly Val Leu Asp Val
 405 410 415
 Ile Tyr Glu Ser Pro Phe Ala Leu Leu Ser Cys Gly Tyr Asp Thr Tyr
 420 425 430
 Val Arg Tyr Trp Asp Cys Arg Thr Ser Val Arg Lys Cys Val Met Glu
 435 440 445
 Trp Glu Glu Pro His Asn Ser Thr Leu Tyr Cys Leu Gln Thr Asp Gly
 450 455 460
 Asn His Leu Leu Ala Thr Gly Ser Ser Phe Tyr Ser Val Val Arg Leu
 465 470 475 480
 Trp Asp Arg His Gln Arg Ala Cys Pro His Thr Phe Pro Leu Thr Ser
 485 490 495
 Thr Arg Leu Gly Ser Pro Val Tyr Cys Leu His Leu Thr Thr Lys His
 500 505 510
 Leu Tyr Ala Ala Leu Ser Tyr Asn Leu His Val Leu Asp Ile Gln Asn
 515 520 525
 Pro

<210> 45
 <211> 1214
 <212> DNA
 <213> Homo sapiens

<220>
 <223> Nucleotide sequence of human F-box protein FBP18

<400> 45
 gcattgctat aattttacta tactctcatc taaatctaaa atcagtccttc aaaataaaaa 60
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 tctttttggc taattgacta attttaactt ctgtgttgct tttccagagg catggctatt 180
 gcaccttggg agaagccttt aatcggttag acttctcaag tgcaattcaa gatatccgaa 240
 cgttcaatta tgttgtcaaa ctgttgcagc taattgcaaa atcccagtta acttcattga 300
 gtggcgtggc acagaagaat tacttcaaca ttttggataa aatcgttcaa aaggttcttg 360
 atgaccacca caatcctcgc ttaatcaaaag atcttctgca agacctaagc tctaccctct 420
 gcattcttat tagaggagta gggaagtctg tattagtggg aaacatcaat atttggattt 480
 gccgattaga aactattctc gcctggcaac aacagctaca ggatcttcag atgactaagc 540
 aagtgaacaa tggcctcacc ctcagtgacc ttctctgca catgctgaac aacatcctat 600
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1214

<210> 46
<211> 272
<212> PRT
<213> Homo sapiens

<220>

<223> Amino Acid sequence of human F-box protein FBP18

<400> 46

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 20           25           30
Ile Arg Thr Phe Asn Tyr Val Val Lys Leu Leu Gln Leu Ile Ala Lys
 35           40           45
Ser Gln Leu Thr Ser Leu Ser Gly Val Ala Gln Lys Asn Tyr Phe Asn
 50           55           60
Ile Leu Asp Lys Ile Val Gln Lys Val Leu Asp Asp His His Asn Pro
 65           70           75           80
Arg Leu Ile Lys Asp Leu Leu Gln Asp Leu Ser Ser Thr Leu Cys Ile
 85           90           95
Leu Ile Arg Gly Val Gly Lys Ser Val Leu Val Gly Asn Ile Asn Ile
100          105          110
Trp Ile Cys Arg Leu Glu Thr Ile Leu Ala Trp Gln Gln Gln Leu Gln
115          120          125
Asp Leu Gln Met Thr Lys Gln Val Asn Asn Gly Leu Thr Leu Ser Asp
130          135          140
Leu Pro Leu His Met Leu Asn Asn Ile Leu Tyr Arg Phe Ser Asp Gly
145          150          155          160
Trp Asp Ile Ile Thr Leu Gly Gln Val Thr Pro Thr Leu Tyr Met Leu
165          170          175
Ser Glu Asp Arg Gln Leu Trp Lys Lys Leu Cys Gln Tyr His Phe Ala
180          185          190
Glu Lys Gln Phe Cys Arg His Leu Ile Leu Ser Glu Lys Gly His Ile
195          200          205
Glu Trp Lys Leu Met Tyr Phe Ala Leu Gln Lys His Tyr Pro Ala Lys
210          215          220
Glu Gln Tyr Gly Asp Thr Leu His Phe Cys Arg His Cys Ser Ile Leu
225          230          235          240
Phe Trp Lys Asp Ser Gly His Pro Cys Thr Ala Ala Asp Pro Asp Ser
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Cys Phe Thr Pro Val Ser Pro Gln His Phe Ile Asp Leu Phe Lys Phe
260          265          270
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<210> 47
<211> 4059
<212> DNA
<213> Homo sapiens

<220>

<223> Nucleotide sequence of human F-box protein FBP19

<400> 47

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agaatggaag gggctcgtcc acctcctcgt cctccatcac cggggagacg gtggccatgg 240
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agaaggagca ggccagcata gaccggctcc cggaccactc catggtgcag atcttctcct 360
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cccagtgtg	ccccgaactg	aggcgactgg	aagtctcagg	ctgttacaat	atctccaacg	660
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gcatcaggca	catctgtcct	acagctggca	gagacagatg	cctcggttct	ttgtcattca	2700
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cctccatgtc	tgtctgcgtg	ttttccacca	aagaatgcaa	agcagacttc	caggtgttta	2880
aattctgttc	actcaacaat	gccagatgaa	tgggaagagg	aacacactga	gatgacttag	2940
actctgggtc	accaaccaga	cccttgga	ggaataacta	aatcattaca	aggtatggat	3000
tttaaatgga	tgaacttca	aattatctta	tttgataga	agtctatatt	ctagcctcat	3060
ttgcatgaag	tcagatagcc	agaagaaatt	ccattgctgg	ttttcacgaa	attcacttgt	3120
cttttgctaa	taaacacatg	gccctttccc	agattattct	ctagccaagc	cccacctttg	3180
ttacggtgaa	atccctcatt	tattttcttc	tcaaaatgcc	cattatccaa	atgcagaacc	3240
tctgcatctc	caagccagtt	atgctgaatt	tgtcaaactt	agacaccctt	gacaactgca	3300
ctcctactgt	aggtcctgt	gcatactgtc	gtcttctgtg	gggatggag	aggttagtgt	3360
gatgaggtgg	tgtctgccc	ggaggtttct	tccaacatc	atggcctccc	atccaatcaa	3420
catcatcaaa	ttacatgtgt	aatcaaggct	ctgtgccatg	ggggaaatga	atcatttagc	3480
taggccagga	tctagtga	gccacagagt	ttaaaacat	gaaagaagtt	gaaggcagca	3540
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gagcagggag	atccagagaa	tgaatccctg	accgcatcac	ctaaactgtc	ttccaaacat	3720
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atztatctgt	tttaaacat	tgttctcttc	ctggctctgc	taaattgaat	gctcattgtt	3960
tgttgttgtt	gtttttta	tctaattgtc	aaatcactgc	gtgctgtatg	aatctagaaa	4020

gccttaattt actaccaaga aataaagcaa tatgttcgt

4059

<210> 48
 <211> 483
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Amino Acid sequence of human F-box protein FBP19

<400> 48
 Tyr Gly Ser Glu Gly Lys Gly Ser Ser Ser Ile Ser Ser Asp Val Ser
 1 5 10 15
 Ser Ser Thr Asp His Thr Pro Thr Lys Ala Gln Lys Asn Val Ala Thr
 20 25 30
 Ser Glu Asp Ser Asp Leu Ser Met Arg Thr Leu Ser Thr Pro Ser Pro
 35 40 45
 Ala Leu Ile Cys Pro Pro Asn Leu Pro Gly Phe Gln Asn Gly Arg Gly
 50 55 60
 Ser Ser Thr Ser Ser Ser Ser Ile Thr Gly Glu Thr Val Ala Met Val
 65 70 75 80
 His Ser Pro Pro Pro Thr Arg Leu Thr His Pro Leu Ile Arg Leu Ala
 85 90 95
 Ser Arg Pro Gln Lys Glu Gln Ala Ser Ile Asp Arg Leu Pro Asp His
 100 105 110
 Ser Met Val Gln Ile Phe Ser Phe Leu Pro Thr Asn Gln Leu Cys Arg
 115 120 125
 Cys Ala Arg Val Cys Arg Arg Trp Tyr Asn Leu Ala Trp Asp Pro Arg
 130 135 140
 Leu Trp Arg Thr Ile Arg Leu Thr Gly Glu Thr Ile Asn Val Asp Arg
 145 150 155 160
 Ala Leu Lys Val Leu Thr Arg Arg Leu Cys Gln Asp Thr Pro Asn Val
 165 170 175
 Cys Leu Met Leu Glu Thr Val Thr Val Ser Gly Cys Arg Arg Leu Thr
 180 185 190
 Asp Arg Gly Leu Tyr Thr Ile Ala Gln Cys Cys Pro Glu Leu Arg Arg
 195 200 205
 Leu Glu Val Ser Gly Cys Tyr Asn Ile Ser Asn Glu Ala Val Phe Asp
 210 215 220
 Val Val Ser Leu Cys Pro Asn Leu Glu His Leu Asp Val Ser Gly Cys
 225 230 235 240
 Ser Lys Val Thr Cys Ile Ser Leu Thr Arg Glu Ala Ser Ile Lys Leu
 245 250 255
 Ser Pro Leu His Gly Lys Gln Ile Ser Ile Arg Tyr Leu Asp Met Thr
 260 265 270
 Asp Cys Phe Val Leu Glu Asp Glu Gly Leu His Thr Ile Ala Ala His
 275 280 285
 Cys Thr Gln Leu Thr His Leu Tyr Leu Arg Arg Cys Val Arg Leu Thr
 290 295 300
 Asp Glu Gly Leu Arg Tyr Leu Val Ile Tyr Cys Ala Ser Ile Lys Glu
 305 310 315 320
 Leu Ser Val Ser Asp Cys Arg Phe Val Ser Asp Phe Gly Leu Arg Glu
 325 330 335
 Ile Ala Lys Leu Glu Ser Arg Leu Arg Tyr Leu Ser Ile Ala His Cys
 340 345 350
 Gly Arg Val Thr Asp Val Gly Ile Arg Tyr Val Ala Lys Tyr Cys Ser
 355 360 365
 Lys Leu Arg Tyr Leu Asn Ala Arg Gly Cys Glu Gly Ile Thr Asp His
 370 375 380
 Gly Val Glu Tyr Leu Ala Lys Asn Cys Thr Lys Leu Lys Ser Leu Asp

385		390		395		400
Ile Gly Lys Cys Pro	Leu Val Ser Asp Thr Gly Leu Glu Cys Leu Ala					
	405		410			415
Leu Asn Cys Phe Asn Leu Lys Arg Leu Ser Leu Lys Ser Cys Glu Ser						
	420		425			430
Ile Thr Gly Gln Gly Leu Gln Ile Val Ala Ala Asn Cys Phe Asp Leu						
	435		440			445
Gln Thr Leu Asn Val Gln Asp Cys Glu Val Ser Val Glu Ala Leu Arg						
	450		455			460
Phe Val Lys Arg His Cys Lys Arg Cys Val Ile Glu His Thr Asn Pro						
465		470		475		480
Ala Phe Phe						

<210> 49
 <211> 850
 <212> DNA
 <213> Homo sapiens

<220>
 <223> Nucleotide sequence of human F-box protein FBP20

<400> 49
 tgcggccgcg cccgcacccg caccggcacc cacgcccacg cccgaggaag ggcccgcgc 60
 gggctgggga gaccgcattc ccttggaat cctggtgcag attttcgggt tgttggtggc 120
 ggcggacggc cccatgccct tctgggcag ggtgcgcg gcgtgccgc gctggcagga 180
 ggccgcttcc caaccgcgc tctggcacac cgtgaccctg tcgtccccgc tggtcggccg 240
 gcctgccaag ggcgggtca aggcggagaa gaagctcctt gcttccctgg agtggcttat 300
 gcccaatcgg ttttcacagc tccagaggct gaccctcatc cactggaagt ctcaggtaca 360
 ccccggtgtg aagctggtag gtgagtgtg tctcggtc actttctca agctctccgg 420
 ctgccacggt gtgactgtg acgctctggt catgctagcc aaagcctgct gccagctcca 480
 tagcctggac ctacagcact ccattggtga gtccacagct gtggtgagct tcttgaggga 540
 ggcaggggcc cgaatgcgca agttgtggct gacctacagc tcccagacga cagccatcct 600
 ggcgcgattg ctgggcagct gctgccccca gctccaggct ctggaggtga gcaccggcat 660
 caaccgtaat agcattcccc ttcagctgcc tgtcgaggct ctgcagaaag gctgccctca 720
 gctccagggt ctgcggctgt tgaacctgat gtggctgccc aagcctccgg gacgaggggt 780
 ggctcccga ccaggcttcc ctagcctaga ggagctctgc ctggcgagct caacctgcaa 840
 ctttgtgagc 850

<210> 50
 <211> 283
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Amino Acid sequence of human F-box protein FBP20

<400> 50
 Ala Ala Ala Pro Ala Pro Ala Pro Ala Pro Thr Pro Thr Pro Glu Glu
 1 5 10 15
 Gly Pro Asp Ala Gly Trp Gly Asp Arg Ile Pro Leu Glu Ile Leu Val
 20 25 30
 Gln Ile Phe Gly Leu Leu Val Ala Ala Asp Gly Pro Met Pro Phe Leu
 35 40 45
 Gly Arg Ala Ala Arg Val Cys Arg Arg Trp Gln Glu Ala Ala Ser Gln
 50 55 60
 Pro Ala Leu Trp His Thr Val Thr Leu Ser Ser Pro Leu Val Gly Arg
 65 70 75 80
 Pro Ala Lys Gly Gly Val Lys Ala Glu Lys Lys Leu Leu Ala Ser Leu
 85 90 95

Glu	Trp	Leu	Met	Pro	Asn	Arg	Phe	Ser	Gln	Leu	Gln	Arg	Leu	Thr	Leu
			100					105					110		
Ile	His	Trp	Lys	Ser	Gln	Val	His	Pro	Val	Leu	Lys	Leu	Val	Gly	Glu
			115				120					125			
Cys	Cys	Pro	Arg	Leu	Thr	Phe	Leu	Lys	Leu	Ser	Gly	Cys	His	Gly	Val
		130				135					140				
Thr	Ala	Asp	Ala	Leu	Val	Met	Leu	Ala	Lys	Ala	Cys	Cys	Gln	Leu	His
145					150					155					160
Ser	Leu	Asp	Leu	Gln	His	Ser	Met	Val	Glu	Ser	Thr	Ala	Val	Val	Ser
			165						170					175	
Phe	Leu	Glu	Glu	Ala	Gly	Ser	Arg	Met	Arg	Lys	Leu	Trp	Leu	Thr	Tyr
			180					185					190		
Ser	Ser	Gln	Thr	Thr	Ala	Ile	Leu	Gly	Ala	Leu	Leu	Gly	Ser	Cys	Cys
		195				200						205			
Pro	Gln	Leu	Gln	Val	Leu	Glu	Val	Ser	Thr	Gly	Ile	Asn	Arg	Asn	Ser
	210					215					220				
Ile	Pro	Leu	Gln	Leu	Pro	Val	Glu	Ala	Leu	Gln	Lys	Gly	Cys	Pro	Gln
225					230					235					240
Leu	Gln	Val	Leu	Arg	Leu	Leu	Asn	Leu	Met	Trp	Leu	Pro	Lys	Pro	Pro
			245					250						255	
Gly	Arg	Gly	Val	Ala	Pro	Gly	Pro	Gly	Phe	Pro	Ser	Leu	Glu	Glu	Leu
			260					265					270		
Cys	Leu	Ala	Ser	Ser	Thr	Cys	Asn	Phe	Val	Ser					
		275					280								

<210> 51
 <211> 1777
 <212> DNA
 <213> Homo sapiens

<220>
 <221> variation
 <222> 1733
 <223> n = a, c, g, or t

<220>
 <223> Nucleotide sequence of human F-box protein FBP21

<400> 51

acaacactgc	tctcagaagg	atactgcaga	actccttaga	ggctcttagcc	tatggaatca	60
tgctgaagag	cgacagaart	tttttaaata	ttccgtggat	gaaaagtcag	ataaagaagc	120
agaagtgtca	gaacactcca	caggtataac	ccatcttcct	cctgaggtaa	tgctgtcaat	180
tttcagctat	cttaatcctc	aagagttatg	tcgatgcagt	caagtaagca	tgaaatggtc	240
tcagctgaca	aaaacgggat	cgctttggaa	acatctttac	cctgttcatt	gggccagagg	300
tgactggtat	agtgggtccc	caactgaact	tgatactgaa	cctgatgatg	aatgggtgaa	360
aaataggaaa	gatgaaagtc	gtgcttttca	tgagtgggat	gaagatgctg	acattgatga	420
atctgaagag	tctgcggagg	aatcaattgc	tatcagcatt	gcacaaatgg	aaaaacgttt	480
actccatggc	ttaattcata	acgtttctacc	atatgttggg	acttctgtaa	aaaccttagt	540
attagcatat	agctctgcag	tttccagcaa	aatggttagg	cagatttttag	agctttgtcc	600
taacctggag	catctggatc	ttaccagac	tgacatttca	gattctgcat	ttgacagttg	660
gtcttggtct	ggttgctgcc	agagtcttcg	gcatcttgat	ctgtctgggt	gtgagaaaat	720
cacagatgtg	gccctagaga	agattttccag	agctcttgga	attctgacat	ctcatcaaag	780
tggctttttt	aaaacatcta	caagcaaaat	tacttcaact	gcgtggaaaa	ataaagacat	840
taccatgcag	tccaccaagc	agtatgcctg	tttgcacgat	ttaactaaca	agggcatttg	900
agaagaaata	gataatgaac	accctggac	taagcctggt	tcttctgaga	atttcacttc	960
tccttatgtg	tggtatgtag	atgctgaaga	tttggctgat	attgaagata	ctgtggaatg	1020
gagacataga	aatgttgaaa	gtctttgtgt	aatggaaaca	gcattccaact	ttagttgttc	1080
cacctctggt	tgtttttagt	aggacattgt	tggactaagg	actagtgtct	gttggcagca	1140
gcattgtgct	tctccagcct	ttgcgtattg	tggtcactca	ttttgttgta	caggaacagc	1200
tttaagaact	atgtcatcac	tcccagaatc	ttctgcaatg	tgtagaaaag	cagcaaggac	1260

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tagattgcct aggggaaaag acttaattta ctttgggagt gaaaaatctg atcaagagac 1320
tgagcgtgta cttctgtttc tcagttttatc tggatgttat cagatcacag accatgggtct 1380
cagggttttg actctgggag gagggctgcc ttatttggag caccttaatc tctctgggtg 1440
tcttactata actggtgcag gcctgcagga tttggtttca gcatgtcctt ctctgaatga 1500
tgaatacttt tactactgtg acaacattaa cggtcctcat gctgataccg ccagtggatg 1560
ccagaatttg cagtgtggtt ttcgagcctg ctgccgctct ggcgaatgac ccttgacttc 1620
tgatctttgt ctacttcatt tagctgagca ggctttcttt catgcacttt actcatagca 1680
catttcttgt gttaaccatc cttttttgag cgtgacttgt tttgggccca ttnyttacaa 1740
cttcagaaat cttaattacc agtgrattgt aatgttg 1777

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<210> 52
<211> 590
<212> PRT
<213> Homo sapiens

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<220>
<221> VARIANT
<222> 576,586
<223> Xaa = unknown amino acid residue

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<220>
<223> Amino Acid sequence of human F-box protein FBP21

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<400> 52
Gln His Cys Ser Gln Lys Asp Thr Ala Glu Leu Leu Arg Gly Leu Ser
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Leu Trp Asn His Ala Glu Glu Arg Gln Lys Phe Phe Lys Tyr Ser Val
20     25     30
Asp Glu Lys Ser Asp Lys Glu Ala Glu Val Ser Glu His Ser Thr Gly
35     40     45
Ile Thr His Leu Pro Pro Glu Val Met Leu Ser Ile Phe Ser Tyr Leu
50     55     60
Asn Pro Gln Glu Leu Cys Arg Cys Ser Gln Val Ser Met Lys Trp Ser
65     70     75     80
Gln Leu Thr Lys Thr Gly Ser Leu Trp Lys His Leu Tyr Pro Val His
85     90     95
Trp Ala Arg Gly Asp Trp Tyr Ser Gly Pro Ala Thr Glu Leu Asp Thr
100    105    110
Glu Pro Asp Asp Glu Trp Val Lys Asn Arg Lys Asp Glu Ser Arg Ala
115    120    125
Phe His Glu Trp Asp Glu Asp Ala Asp Ile Asp Glu Ser Glu Glu Ser
130    135    140
Ala Glu Glu Ser Ile Ala Ile Ser Ile Ala Gln Met Glu Lys Arg Leu
145    150    155    160
Leu His Gly Leu Ile His Asn Val Leu Pro Tyr Val Gly Thr Ser Val
165    170    175
Lys Thr Leu Val Leu Ala Tyr Ser Ser Ala Val Ser Ser Lys Met Val
180    185    190
Arg Gln Ile Leu Glu Leu Cys Pro Asn Leu Glu His Leu Asp Leu Thr
195    200    205
Gln Thr Asp Ile Ser Asp Ser Ala Phe Asp Ser Trp Ser Trp Leu Gly
210    215    220
Cys Cys Gln Ser Leu Arg His Leu Asp Leu Ser Gly Cys Glu Lys Ile
225    230    235    240
Thr Asp Val Ala Leu Glu Lys Ile Ser Arg Ala Leu Gly Ile Leu Thr
245    250    255
Ser His Gln Ser Gly Phe Leu Lys Thr Ser Thr Ser Lys Ile Thr Ser
260    265    270
Thr Ala Trp Lys Asn Lys Asp Ile Thr Met Gln Ser Thr Lys Gln Tyr
275    280    285
Ala Cys Leu His Asp Leu Thr Asn Lys Gly Ile Gly Glu Glu Ile Asp

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290		295		300
Asn Glu His Pro Trp	Thr Lys Pro Val Ser	Ser Glu Asn Phe Thr Ser		
305	310	315		320
Pro Tyr Val Trp Met	Leu Asp Ala Glu Asp	Leu Ala Asp Ile Glu Asp		
	325	330		335
Thr Val Glu Trp Arg	His Arg Asn Val Glu	Ser Leu Cys Val Met Glu		
	340	345		350
Thr Ala Ser Asn Phe	Ser Cys Ser Thr Ser	Gly Cys Phe Ser Lys Asp		
	355	360		365
Ile Val Gly Leu Arg	Thr Ser Val Cys Trp	Gln Gln His Cys Ala Ser		
	370	375		380
Pro Ala Phe Ala Tyr	Cys Gly His Ser Phe	Cys Cys Thr Gly Thr Ala		
385	390	395		400
Leu Arg Thr Met Ser	Ser Leu Pro Glu Ser	Ser Ala Met Cys Arg Lys		
	405	410		415
Ala Ala Arg Thr Arg	Leu Pro Arg Gly Lys	Asp Leu Ile Tyr Phe Gly		
	420	425		430
Ser Glu Lys Ser Asp	Gln Glu Thr Gly Arg	Val Leu Leu Phe Leu Ser		
	435	440		445
Leu Ser Gly Cys Tyr	Gln Ile Thr Asp His	Gly Leu Arg Val Leu Thr		
	450	455		460
Leu Gly Gly Gly Leu	Pro Tyr Leu Glu His	Leu Asn Leu Ser Gly Cys		
465	470	475		480
Leu Thr Ile Thr Gly	Ala Gly Leu Gln Asp	Leu Val Ser Ala Cys Pro		
	485	490		495
Ser Leu Asn Asp Glu	Tyr Phe Tyr Tyr Cys	Asp Asn Ile Asn Gly Pro		
	500	505		510
His Ala Asp Thr Ala	Ser Gly Cys Gln Asn	Leu Gln Cys Gly Phe Arg		
	515	520		525
Ala Cys Cys Arg Ser	Gly Glu Pro Leu Thr	Ser Asp Leu Cys Leu Leu		
	530	535		540
His Leu Ala Glu Gln	Ala Phe Phe His Ala	Leu Tyr Ser His Ile Ser		
545	550	555		560
Cys Val Asn His Pro	Phe Leu Ser Val Thr	Cys Phe Gly Pro Ile Xaa		
	565	570		575
Tyr Asn Phe Arg Asn	Leu Asn Tyr Gln Xaa	Ile Val Met Leu		
	580	585		590

<210> 53

<211> 1681

<212> DNA

<213> Homo sapiens

<220>

<221> variation

<222> 348

<223> n = a, g, c, or t

<220>

<223> Nucleotide sequence of human F-box protein FBP22

<400> 53

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ttttactgta cacagttgat gtattttgat gctgggcctg tctgggtctgt cttgaggatt 60
attaaccttt agaggtatca gagaagcaaa tgggtactgg tgaggctgct cattagggaa 120
gagggcaaaa ggagcactag ctaggtcaga gccatgtttc aggtcacaaat gtgatgtcag 180
atgttgctta taaatccttt cttgtcttcg ccattcttaa atcttgatag gtgcctgttg 240
ggaaactgta aatgcctttc ccaatggaga atcaacagat tgggtgatgg tggagtcggt 300
caggaagact caggtcttct agaggaaagg atgcctcatc accccttngg cccaggcagc 360
tgctgtcaga gaatgacaca gcacctgcac agtcgctgtc cacttcctgc cactgctgtc 420
ggtgggggtga cgaggagcaa gtaggcgtgg actttgacat gagggagctg agccccgcac 480

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cgcttgatgc ctgcacgggt aacctgctgg cagtcgtaca gctcgaggcg ctccaggcct 540
cggcagttct ctaggtgtyc cagggccaca tcagtgatga ggaggcagtt gtccaactcc 600
agtacccgca gcctctcatg gccacaggta ctgttgctca ggtgcaggat cccatcatct 660
gkgatgagtt cacagtggga caggctcagg gcttgacagt taggacagtg aatggagagc 720
tggtatgagtg tgctgtcggt tatcaggatg cawtcttcaa gatccatctt ctccaattcg 780
tggcaattcc gagctaaaag tgtaaaacct gcgtcagtca aatgggagca tcgggcagcc 840
tccaaaattt gcagtcgcgg acagttcaaa cccagggtg taagagaggc atctgtgagg 900
ttgctgcaac ccgaaaggca gagagcctgt agccggtgac agcccctgca tatctgcacc 960
acaccttcac ccgtgatacg tgagcaggac tgcaagttga ggctcacaag ctcatggcag 1020
taattctgaa tgtgtttcag agcttcatct tctaactgtg tgcagcccct caggagcagg 1080
gctttcaggc ctgcacaacc tcgcaccagt gcctcgatgc catccttcgt gatctgatca 1140
caccaagaga ggttcaggta ctccagggtt cggcagccct cactgatccc cttcaaggag 1200
ctgtttgtaa tagacacaca ggaggtcaga wccagatggt tcagcttgga acagaatctg 1260
ctaaggctat aacacgtgct gtcagtgatt tttgtgcata cattgaggtt caaatgttca 1320
atgtttcggc agttctgtgc aaaggtcttc aaggaggaat ccccaacacc aatgcagcct 1380
cgcaagctga gcttcctcag gaatccaacg catcgcttcg agatattttc caccactcga 1440
ccctctacat ctatttgaaa gttaaaaaga tctattcttt gccagttgct tccatccagg 1500
gctaagatgt tccaagcctt ggaaatctgt gcacatcggc acaaagttac tatatccaag 1560
aaggaaaata ttcttaacag aagttctttg ggtaactttt tgtaataaag gccttcatca 1620
ttgtttgaga aaaccatggc cgaagagccg cgagcgagcc cacagcccga agtcacacgg 1680
c 1681

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<210> 54
 <211> 549
 <212> PRT
 <213> Homo sapiens

<220>
 <221> VARIANT
 <222> 150,309,340, 374
 <223> Xaa = unknown amino acid residue

<220>
 <223> Amino Acid sequence of human F-box protein FBP22

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<400> 54
Arg Val Thr Ser Gly Cys Gly Leu Ala Arg Gly Ser Ser Ala Met Val
1          5          10          15
Phe Ser Asn Asn Asp Glu Gly Leu Ile Asn Lys Lys Leu Pro Lys Glu
20          25          30
Leu Leu Leu Arg Ile Phe Ser Phe Leu Asp Ile Val Thr Leu Cys Arg
35          40          45
Cys Ala Gln Ile Ser Lys Ala Trp Asn Ile Leu Ala Leu Asp Gly Ser
50          55          60
Asn Trp Gln Arg Ile Asp Leu Phe Asn Phe Gln Ile Asp Val Glu Gly
65          70          75          80
Arg Val Val Glu Asn Ile Ser Lys Arg Cys Val Gly Phe Leu Arg Lys
85          90          95
Leu Ser Leu Arg Gly Cys Ile Gly Val Gly Asp Ser Ser Leu Lys Thr
100         105         110
Phe Ala Gln Asn Cys Arg Asn Ile Glu His Leu Asn Leu Asn Gly Cys
115         120         125
Thr Lys Ile Thr Asp Ser Thr Cys Tyr Ser Leu Ser Arg Phe Cys Ser
130         135         140
Lys Leu Lys His Leu Xaa Leu Thr Ser Cys Val Ser Ile Thr Asn Ser
145         150         155         160
Ser Leu Lys Gly Ile Ser Phe Gly Cys Arg Asn Leu Glu Tyr Leu Asn
165         170         175
Leu Ser Trp Cys Asp Gln Ile Thr Lys Asp Gly Ile Glu Ala Leu Val
180         185         190

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Arg Gly Cys Arg Gly Leu Lys Ala Leu Leu Leu Arg Gly Cys Thr Gln
 195 200 205
 Leu Glu Asp Glu Ala Leu Lys His Ile Gln Asn Tyr Cys His Glu Leu
 210 215 220
 Val Ser Leu Asn Leu Gln Ser Cys Ser Arg Ile Thr Asp Glu Gly Val
 225 230 235 240
 Val Gln Ile Cys Arg Gly Cys His Arg Leu Gln Ala Leu Cys Leu Ser
 245 250 255
 Gly Cys Ser Asn Leu Thr Asp Ala Ser Leu Thr Ala Leu Gly Leu Asn
 260 265 270
 Cys Pro Arg Leu Gln Ile Leu Glu Ala Ala Arg Cys Ser His Leu Thr
 275 280 285
 Asp Ala Gly Phe Thr Leu Leu Ala Arg Asn Cys His Glu Leu Glu Lys
 290 295 300
 Met Asp Leu Glu Xaa Cys Ile Leu Ile Thr Asp Ser Thr Leu Ile Gln
 305 310 315 320
 Leu Ser Ile His Cys Pro Lys Leu Gln Ala Leu Ser Leu Ser His Cys
 325 330 335
 Glu Leu Ile Xaa Asp Asp Gly Ile Leu His Leu Ser Asn Ser Thr Cys
 340 345 350
 Gly His Glu Arg Leu Arg Val Leu Glu Leu Asp Asn Cys Leu Leu Ile
 355 360 365
 Thr Asp Val Ala Leu Xaa His Leu Glu Asn Cys Arg Gly Leu Glu Arg
 370 375 380
 Leu Glu Leu Tyr Asp Cys Gln Gln Val Thr Arg Ala Gly Ile Lys Arg
 385 390 395 400
 Met Arg Ala Gln Leu Pro His Val Lys Val His Ala Tyr Phe Ala Pro
 405 410 415
 Val Thr Pro Pro Thr Ala Val Ala Gly Ser Gly Gln Arg Leu Cys Arg
 420 425 430
 Cys Cys Val Ile Leu Gln Gln Leu Pro Gly Pro Lys Gly Gly Ile Leu
 435 440 445
 Ser Ser Arg Arg Pro Glu Ser Ser Pro Thr Pro Pro Ser Pro Asn Leu
 450 455 460
 Leu Ile Leu His Trp Glu Arg His Leu Gln Phe Pro Asn Arg His Leu
 465 470 475 480
 Ser Arg Phe Lys Asn Gly Glu Asp Lys Lys Gly Phe Ile Ser Asn Ile
 485 490 495
 His His Ile Val Thr Asn Met Ala Leu Thr Leu Val Leu Leu Pro
 500 505 510
 Ser Ser Leu Met Ser Ser Leu Thr Ser Thr His Leu Leu Leu Tyr Leu
 515 520 525
 Arg Leu Ile Ile Leu Lys Thr Asp Gln Thr Gly Pro Ala Ser Lys Tyr
 530 535 540
 Ile Asn Cys Val Gln
 545

<210> 55

<211> 1866

<212> DNA

<213> Homo sapiens

<220>

<223> Nucleotide sequence of human F-box protein FBP23

<400> 55

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 cgccgagcca ggacagctac aagaggagaa atgatgaaca cccatagagc tatagaatca 120
 aacagccaga cttccctct caatgcagag gtagtccagt atgcaaaga agtagtgat 180
 ttcagttccc attatggaag tgagaatagt atgtcctata ctatgtggaa tttggctggt 240


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gtaccaaattg tattcccaag ttctggtgac ttactcaga cagctgtgtt tcgaacttat 300
gggacatgggt gggatcagtg tcctagtgtc tccttgccat tcaagaggac gccacctaatt 360
tttcagagccc aggactatgt ggaacttact tttgaacaac aggtgtatcc tacagctgta 420
catgtttctag aaacctatca tcccggagca gtcattagaa ttctcgcttg ttctgcaaat 480
ccttattccc caaatccacc agctgaagta agatgggaga ttctttgggtc agagagacct 540
acgaaggtga atgcttccca agctcgccag tttaaacctt gtattaagca gataaatttc 600
cccacaaatc ttatacgact ggaagtaaat agttctcttc tggaatatta cactgaatta 660
gatgcagttg tgctacatgg tgtgaaggac aagccagtg c tttctctcaa gacttcactt 720
attgacatga atgatataga agatgatgcc tatgcagaaa aggatgggtg tggaatggac 780
agtcttaaca aaaagtttag cagtgtgtgc ctcggggaag ggccaaataa tgggtatttt 840
gataaactac cttatgagct tattcagctg attctgaatc atcttacct accagacctg 900
tgtagattag cacagacttg caaactactg agccagcatt gctgtgatcc tctgcaatac 960
atccacctca atctgcaacc atactgggca aaactagatg acacttctct ggaatttcta 1020
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gcttctgggt gtccactact ggaggagctt gaccttggct ggtgcccaac tctgcagagc 1560
agcacccgggt gcttcaccag actggcacac cagctcccaa acttgcaaaa actctttctt 1620
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ttacagcagc tggacatatt aggaacaaga atggtgaagc cggcatcctt aagaaaactc 1740
ctggaatctt gtaaagatct tcttttactt gatgtgtcct tctgttcgca gattgataac 1800
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cagtga

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<210> 56

<211> 621

<212> PRT

<213> Homo sapiens

<220>

<223> Amino Acid sequence of human F-box protein FBP23

<400> 56

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Met Ser Pro Val Phe Pro Met Leu Thr Val Leu Thr Met Phe Tyr Tyr
1          5          10          15
Ile Cys Leu Arg Arg Arg Ala Arg Thr Ala Thr Arg Gly Glu Met Met
20          25          30
Asn Thr His Arg Ala Ile Glu Ser Asn Ser Gln Thr Ser Pro Leu Asn
35          40          45
Ala Glu Val Val Gln Tyr Ala Lys Glu Val Val Asp Phe Ser Ser His
50          55          60
Tyr Gly Ser Glu Asn Ser Met Ser Tyr Thr Met Trp Asn Leu Ala Gly
65          70          75          80
Val Pro Asn Val Phe Pro Ser Ser Gly Asp Phe Thr Gln Thr Ala Val
85          90          95
Phe Arg Thr Tyr Gly Thr Trp Trp Asp Gln Cys Pro Ser Ala Ser Leu
100         105         110
Pro Phe Lys Arg Thr Pro Pro Asn Phe Gln Ser Gln Asp Tyr Val Glu
115         120         125
Leu Thr Phe Glu Gln Gln Val Tyr Pro Thr Ala Val His Val Leu Glu
130         135         140
Thr Tyr His Pro Gly Ala Val Ile Arg Ile Leu Ala Cys Ser Ala Asn
145         150         155         160
Pro Tyr Ser Pro Asn Pro Pro Ala Glu Val Arg Trp Glu Ile Leu Trp
165         170         175
Ser Glu Arg Pro Thr Lys Val Asn Ala Ser Gln Ala Arg Gln Phe Lys

```


<220>

<223> Nucleotide sequence of human F-box protein FBP24

<400> 57

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atgcaacttg tacctgatat agagttcaag attacttata cccggtctcc agatgggtgat 60
ggcgttgga acagctacat tgaagataat gatgatgaca gcaaaatggc agatctcttg 120
tcctacttcc agcagcaact cacatttcag gagtctgtgc ttaaactgtg tcagcctgag 180
cttgagagca gtcagattca catatcagtg ctgccaatgg aggtcctgat gtacatcttc 240
cgatgggtgg tgtctagtga cttggacctc agatcattgg agcagttgtc gctgggtgtgc 300
agaggattct acatctgtgc cagagaccct gaaatatggc gtctggcctg cttgaaagtt 360
tggggcagaa gctgtattaa acttgttccg tacacgtcct ggagagagat gtttttagaa 420
cggcctcgtg ttcggtttga tggcgtgtat atcagtaaaa ccacatatat tcgtcaaggg 480
gaacagtctc ttgatggttt ctatagagcc tggcaccaag tggaatatta caggtacata 540
agattctttc ctgatggcca tgtgatgatg ttgacaaccc ctgaagagcc tcagtccatt 600
gttccacgtt taagaactag gaataccagg actgatgcaa ttctactggg tcactatcgc 660
ttgtcacaag acacagacaa tcagacccaa gtatttgctg taataactaa gaaaaagaa 720
gaaaaaccac ttgactataa atacagatat tttcgtcgtg tccctgtaca agaagcagat 780
cagagttttc atgtggggct acagctatgt tccagtggtc accagaggtt caacaaactc 840
atctggatac atcattcttg tcacattact tacaatcaa ctggtgagac tgcagtcagt 900
gcttttgaga ttgacaagat gtacaccccc ttgttcttcg ccagagtaag gagctacaca 960
gctttctcag aaaggcctct gtag 984
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<210> 58

<211> 327

<212> PRT

<213> Homo sapiens

<220>

<223> Amino Acid sequence of human F-box protein FBP24

<400> 58

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Met Gln Leu Val Pro Asp Ile Glu Phe Lys Ile Thr Tyr Thr Arg Ser
 1           5           10           15
Pro Asp Gly Asp Gly Val Gly Asn Ser Tyr Ile Glu Asp Asn Asp Asp
      20           25           30
Asp Ser Lys Met Ala Asp Leu Leu Ser Tyr Phe Gln Gln Gln Leu Thr
      35           40           45
Phe Gln Glu Ser Val Leu Lys Leu Cys Gln Pro Glu Leu Glu Ser Ser
      50           55           60
Gln Ile His Ile Ser Val Leu Pro Met Glu Val Leu Met Tyr Ile Phe
      65           70           75           80
Arg Trp Val Val Ser Ser Asp Leu Asp Leu Arg Ser Leu Glu Gln Leu
      85           90           95
Ser Leu Val Cys Arg Gly Phe Tyr Ile Cys Ala Arg Asp Pro Glu Ile
      100          105          110
Trp Arg Leu Ala Cys Leu Lys Val Trp Gly Arg Ser Cys Ile Lys Leu
      115          120          125
Val Pro Tyr Thr Ser Trp Arg Glu Met Phe Leu Glu Arg Pro Arg Val
      130          135          140
Arg Phe Asp Gly Val Tyr Ile Ser Lys Thr Thr Tyr Ile Arg Gln Gly
      145          150          155          160
Glu Gln Ser Leu Asp Gly Phe Tyr Arg Ala Trp His Gln Val Glu Tyr
      165          170          175
Tyr Arg Tyr Ile Arg Phe Phe Pro Asp Gly His Val Met Met Leu Thr
      180          185          190
Thr Pro Glu Glu Pro Gln Ser Ile Val Pro Arg Leu Arg Thr Arg Asn
      195          200          205
Thr Arg Thr Asp Ala Ile Leu Leu Gly His Tyr Arg Leu Ser Gln Asp
      210          215          220
```

Thr Asp Asn Gln Thr Lys Val Phe Ala Val Ile Thr Lys Lys Lys Glu
 225 230 235 240
 Glu Lys Pro Leu Asp Tyr Lys Tyr Arg Tyr Phe Arg Arg Val Pro Val
 245 250 255
 Gln Glu Ala Asp Gln Ser Phe His Val Gly Leu Gln Leu Cys Ser Ser
 260 265 270
 Gly His Gln Arg Phe Asn Lys Leu Ile Trp Ile His His Ser Cys His
 275 280 285
 Ile Thr Tyr Lys Ser Thr Gly Glu Thr Ala Val Ser Ala Phe Glu Ile
 290 295 300
 Asp Lys Met Tyr Thr Pro Leu Phe Phe Ala Arg Val Arg Ser Tyr Thr
 305 310 315 320
 Ala Phe Ser Glu Arg Pro Leu
 325

<210> 59
 <211> 765
 <212> DNA
 <213> Homo sapiens

<220>
 <221> variation
 <222> 471
 <223> n = a, c, g, or t

<220>
 <223> Nucleotide sequence of human F-box protein FBP25

<400> 59
 gcagccctgg atcctgactt agagaatgat gatttctttg tcagaaagac tggggcctttc 60
 catgcaaatc catatgttct ccgagctttt gaagacttta gaaagttctc tgagcaagat 120
 gattctgtag agcgagatat aattttacag tgtagagaag gtgaacttgt acttccggat 180
 ttggaaaaag atgatatgat tggtcgccga atcccagcac agaagaaaga agtgccgctg 240
 tctggggccc cagatagata ccaccagtc ctttttcccg aaccctggac tcttctcca 300
 gaaattcaag caaaatttct ctgtgtactt gaaaggacat gcccatccaa agaaaaaagt 360
 aatagctgta gaatattagt tccttcatat cggcagaaga aagatgacat gctgacacgt 420
 aagattcagt cctggaaact gggaactacc gtgcctccca tcagtttcac ncttgcccc 480
 tgcagtgagg ctgacttgaa gagatgggag gccatccggg aggccagcag actcaggcac 540
 aagaaaaggc tgatggtgga gagactcttt caaaagattt atggtgagaa tgggagtaag 600
 tccatgagtg atgtcagcgc agaagatggt caaaacttgc gtcagctgcg ttacgaggag 660
 atgcagaaaa taaaatcaca attaaaagaa caagatcaga aatggcagga tgaccttgca 720
 aatggaaaag atcgtcgaaa aagttacact tcagatctgc agaag 765

<210> 60
 <211> 255
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Amino Acid sequence of human F-box protein FBP25

<400> 60
 Ala Ala Leu Asp Pro Asp Leu Glu Asn Asp Asp Phe Phe Val Arg Lys
 1 5 10 15
 Thr Gly Ala Phe His Ala Asn Pro Tyr Val Leu Arg Ala Phe Glu Asp
 20 25 30
 Phe Arg Lys Phe Ser Glu Gln Asp Asp Ser Val Glu Arg Asp Ile Ile
 35 40 45
 Leu Gln Cys Arg Glu Gly Glu Leu Val Leu Pro Asp Leu Glu Lys Asp
 50 55 60

Asp Met Ile Val Arg Arg Ile Pro Ala Gln Lys Lys Glu Val Pro Leu
 65 70 75 80
 Ser Gly Ala Pro Asp Arg Tyr His Pro Val Pro Phe Pro Glu Pro Trp
 85 90 95
 Thr Leu Pro Pro Glu Ile Gln Ala Lys Phe Leu Cys Val Leu Glu Arg
 100 105 110
 Thr Cys Pro Ser Lys Glu Lys Ser Asn Ser Cys Arg Ile Leu Val Pro
 115 120 125
 Ser Tyr Arg Gln Lys Lys Asp Asp Met Leu Thr Arg Lys Ile Gln Ser
 130 135 140
 Trp Lys Leu Gly Thr Thr Val Pro Pro Ile Ser Phe Thr Pro Gly Pro
 145 150 155 160
 Cys Ser Glu Ala Asp Leu Lys Arg Trp Glu Ala Ile Arg Glu Ala Ser
 165 170 175
 Arg Leu Arg His Lys Lys Arg Leu Met Val Glu Arg Leu Phe Gln Lys
 180 185 190
 Ile Tyr Gly Glu Asn Gly Ser Lys Ser Met Ser Asp Val Ser Ala Glu
 195 200 205
 Asp Val Gln Asn Leu Arg Gln Leu Arg Tyr Glu Glu Met Gln Lys Ile
 210 215 220
 Lys Ser Gln Leu Lys Glu Gln Asp Gln Lys Trp Gln Asp Asp Leu Ala
 225 230 235 240
 Lys Trp Lys Asp Arg Arg Lys Ser Tyr Thr Ser Asp Leu Gln Lys
 245 250 255

<210> 61
 <211> 36
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Conserved F-box motif amino acid residues in the human F-box protein
 FBP8

<400> 61
 Leu Pro Pro Glu Leu Ser Phe Thr Ile Leu Ser Tyr Leu Asn Ala Thr
 1 5 10 15
 Asp Leu Cys Leu Ala Ser Cys Val Trp Gln Asp Leu Ala Asn Asp Glu
 20 25 30
 Leu Leu Trp Gln
 35

<210> 62
 <211> 42
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Conserved F-box motif amino acid residues in the human F-box protein
 FBP9

<400> 62
 Leu Pro Gly Glu Val Leu Glu Tyr Ile Leu Cys Cys Gly Ser Leu Thr
 1 5 10 15
 Ala Ala Asp Ile Gly Arg Val Ser Ser Thr Cys Arg Arg Leu Arg Glu
 20 25 30
 Leu Cys Gln Ser Ser Gly Lys Val Trp Lys
 35 40

<210> 63
 <211> 44
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Conserved F-box motif amino acid residues in the human F-box protein
 FBP10

<400> 63
 Leu Ala Glu Val Val Glu Arg Val Leu Thr Phe Leu Pro Ala Lys Ala
 1 5 10 15
 Leu Leu Arg Val Ala Cys Val Cys Arg Leu Trp Arg Glu Cys Val Arg
 20 25 30
 Arg Val Leu Arg Thr His Arg Ser Val Thr Trp Ile
 35 40

<210> 64
 <211> 39
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Conserved F-box motif amino acid residues in the human F-box protein
 FBP11

<400> 64
 Leu Pro Asp Glu Val Val Leu Lys Ile Phe Ser Tyr Leu Leu Glu Gln
 1 5 10 15
 Asp Leu Cys Arg Ala Ala Cys Val Cys Lys Arg Phe Ser Glu Leu Ala
 20 25 30
 Asn Asp Pro Asn Leu Trp Lys
 35

<210> 65
 <211> 41
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Conserved F-box motif amino acid residues in the human F-box protein
 FBP12

<400> 65
 Leu Pro Leu Glu Leu Trp Arg Met Ile Leu Ala Tyr Leu His Leu Pro
 1 5 10 15
 Asp Leu Gly Arg Cys Ser Leu Val Cys Arg Ala Trp Tyr Glu Leu Ile
 20 25 30
 Leu Ser Leu Asp Ser Thr Arg Trp Arg
 35 40

<210> 66
 <211> 39
 <212> PRT
 <213> Homo sapiens

<220>

<223> Conserved F-box motif amino acid residues in the human F-box protein
FBP14

<400> 66
Leu Pro Thr Asp Pro Leu Leu Leu Ile Leu Ser Phe Leu Asp Tyr Arg
1 5 10 15
Asp Leu Ile Asn Cys Cys Tyr Val Ser Arg Arg Leu Ser Gln Leu Ser
20 25 30
Ser His Asp Pro Leu Trp Arg
35

<210> 67
<211> 40
<212> PRT
<213> Homo sapiens

<220>
<223> Conserved F-box motif amino acid residues in the human F-box protein
FBP16

<400> 67
Leu Pro Glu Pro Leu Leu Leu Arg Val Leu Ala Ala Leu Pro Ala Ala
1 5 10 15
Glu Leu Val Gln Ala Cys Arg Leu Val Cys Leu Arg Trp Lys Glu Leu
20 25 30
Val Asp Gly Ala Pro Leu Trp Leu
35 40

<210> 68
<211> 40
<212> PRT
<213> Homo sapiens

<220>
<223> Conserved F-box motif amino acid residues in the human F-box protein
FBP16

<400> 68
Leu Phe Pro Pro Glu Leu Val Glu His Ile Ile Ser Phe Leu Pro Val
1 5 10 15
Arg Asp Leu Val Ala Leu Gly Gln Thr Cys Arg Tyr Phe His Glu Val
20 25 30
Cys Asp Gly Glu Gly Val Trp Arg
35 40

<210> 69
<211> 44
<212> PRT
<213> Homo sapiens

<220>
<223> Conserved F-box motif amino acid residues in the human F-box protein
FBP17

<400> 69
Leu Pro Glu Val Leu Leu Leu His Met Cys Ser Tyr Leu Asp Met Arg

```

1           5           10           15
Ala Leu Gly Arg Leu Ala Gln Val Tyr Arg Trp Leu Trp His Phe Thr
                20                25                30
Asn Cys Asp Leu Leu Arg Arg Gln Ile Ala Trp Ala
            35                40

```

<210> 70
 <211> 40
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Conserved F-box motif amino acid residues in the human F-box protein
 FBP18

```

<400> 70
Leu Pro Leu His Met Leu Asn Asn Ile Leu Tyr Arg Phe Ser Asp Gly
1           5           10           15
Trp Asp Ile Ile Thr Leu Gly Gln Val Thr Pro Thr Leu Tyr Met Leu
                20                25                30
Ser Glu Asp Arg Gln Leu Trp Lys
            35                40

```

<210> 71
 <211> 39
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Conserved F-box motif amino acid residues in the human F-box protein
 FBP19

```

<400> 71
Leu Pro Asp His Ser Met Val Gln Ile Phe Ser Phe Leu Pro Thr Asn
1           5           10           15
Gln Leu Cys Arg Cys Ala Arg Val Cys Arg Arg Trp Tyr Asn Leu Ala
                20                25                30
Trp Asp Pro Arg Leu Trp Arg
            35

```

<210> 72
 <211> 44
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Conserved F-box motif amino acid residues in the human F-box protein
 FBP20

```

<400> 72
Ile Pro Leu Glu Ile Leu Val Gln Ile Phe Gly Leu Leu Val Ala Ala
1           5           10           15
Asp Gly Pro Met Pro Phe Leu Gly Arg Ala Ala Arg Val Cys Arg Arg
                20                25                30
Trp Gln Glu Ala Ala Ser Gln Pro Ala Leu Trp His
            35                40

```


<210> 73
 <211> 39
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Conserved F-box motif amino acid residues in the human F-box protein
 FBP21

<400> 73
 Leu Pro Pro Glu Val Met Leu Ser Ile Phe Ser Tyr Leu Asn Pro Gln
 1 5 10 15
 Glu Leu Cys Arg Cys Ser Gln Val Ser Met Lys Trp Ser Gln Leu Thr
 20 25 30
 Lys Thr Gly Ser Leu Trp Lys
 35

<210> 74
 <211> 39
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Conserved F-box motif amino acid residues in the human F-box protein
 FBP22

<400> 74
 Leu Pro Lys Glu Leu Leu Leu Arg Ile Phe Ser Phe Leu Asp Ile Val
 1 5 10 15
 Thr Leu Cys Arg Cys Ala Gln Ile Ser Lys Ala Trp Asn Ile Leu Ala
 20 25 30
 Leu Asp Gly Ser Asn Trp Gln
 35

<210> 75
 <211> 48
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Conserved F-box motif amino acid residues in the human F-box protein
 FBP23

<400> 75
 Leu Pro Tyr Glu Leu Ile Gln Leu Ile Leu Asn His Leu Thr Leu Pro
 1 5 10 15
 Asp Leu Cys Arg Leu Ala Gln Thr Cys Lys Leu Leu Ser Gln His Cys
 20 25 30
 Cys Asp Pro Leu Gln Tyr Ile His Leu Asn Leu Gln Pro Tyr Trp Ala
 35 40 45

<210> 76
 <211> 44

<212> PRT
<213> Homo sapiens

<220>
<223> Conserved F-box motif amino acid residues in the human F-box protein
FBP24

<400> 76
Leu Pro Met Glu Val Leu Met Tyr Ile Phe Arg Trp Val Val Ser Ser
1 5 10 15
Asp Leu Asp Leu Arg Ser Leu Glu Gln Leu Ser Leu Val Cys Arg Gly
20 25 30
Phe Tyr Ile Cys Ala Arg Asp Pro Glu Ile Trp Arg
35 40

<210> 77
<211> 49
<212> PRT
<213> Homo sapiens

<220>
<223> Conserved F-box motif amino acid residues in the human F-box protein
FBP25

<400> 77
Leu Pro Pro Glu Ile Gln Ala Lys Phe Leu Cys Val Leu Glu Arg Thr
1 5 10 15
Cys Pro Ser Lys Glu Lys Ser Asn Ser Cys Arg Ile Leu Val Pro Ser
20 25 30
Tyr Arg Gln Lys Lys Asp Asp Met Leu Thr Arg Lys Ile Gln Ser Trp
35 40 45
Lys

<210> 78
<211> 39
<212> PRT
<213> Homo sapiens

<220>
<223> Conserved F-box motif amino acid residues in the human F-box protein
FBP3b

<400> 78
Leu Pro His His Val Val Leu Gln Ile Phe Gln Tyr Leu Pro Leu Leu
1 5 10 15
Asp Arg Ala Cys Ala Ser Ser Val Cys Arg Arg Trp Asn Glu Val Phe
20 25 30
His Ile Ser Asp Leu Trp Arg
35

<210> 79
<211> 43
<212> PRT
<213> Homo sapiens

<220>
<223> Conserved F-box motif amino acid residues in the human F-box protein
FBP13

<400> 79
Leu Trp Ala Trp Gly Glu Lys Gly Val Leu Ser Asn Ile Ser Ala Leu
1 5 10 15
Thr Asp Leu Gly Gly Leu Asp Pro Val Trp Leu Val Cys Gly Ser Trp
20 25 30
Arg Arg His Val Gly Ala Gly Leu Cys Trp Ala
35 40

<210> 80
<211> 59
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide

<400> 80
agtagtaaca aaggtcaaag acagttgact gtatcgtcga ggatgccttc aattaagtt 59

<210> 81
<211> 58
<212> DNA
<213> Artificial Sequence

<220>
<223> Purified primer from Gene Link, Inc.

<400> 81
gcggttactt acttagagct cgacgtctta cttacttagc tcacttctct tcacacca 58

<210> 82
<211> 12
<212> PRT
<213> Homo sapiens

<220>
<223> Carboxy-terminus of human Cull

<400> 82
Cys Asp Gly Glu Lys Asp Thr Tyr Ser Tyr Leu Ala
1 5 10

<210> 83
<211> 25
<212> PRT
<213> Homo sapiens

<220>
<223> Peptide located 87 amino acids from
carboxy-terminus of human Cul2

<400> 83
Cys Glu Ser Ser Phe Ser Leu Asn Met Asn Phe Ser Ser Lys Arg Thr

1 5 10 15
 Lys Phe Lys Ile Thr Thr Ser Met Gln
 20 25

<210> 84
 <211> 12
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Carboxy-terminus of human Skp1

<400> 84
 Cys Glu Glu Ala Gln Val Arg Lys Glu Asn Gln Trp
 1 5 10

<210> 85
 <211> 19
 <212> PRT
 <213> Homo sapiens

<220>
 <223> phospho-peptide with phosphothreonine at position 187

<400> 85
 Asn Ala Gly Ser Val Glu Gln Thr Pro Lys Lys Pro Gly Leu Arg Arg
 1 5 10 15
 Arg Gln Thr

<210> 86
 <211> 17
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Antisense direction of human Skp2 cDNA
 nucleotides 180-196

<400> 86
 cctgggggat gttctca 17

<210> 87
 <211> 17
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Oligonucleotide

<400> 87
 ggcttccggg catttag 17

<210> 88
 <211> 17
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Antisense direction of human Skp2 cDNA nucleotides
 1137-1153

<400> 88
 catctggcac gattcca 17

<210> 89
 <211> 17
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Oligonucleotide

<400> 89
 ccgctcatcg tatgaca 17

<210> 90
 <211> 19
 <212> PRT
 <213> Homo sapiens

<400> 90
 Ala Glu Ile Gly Val Gly Ala Tyr Gly Thr Val Tyr Lys Ala Arg Asp
 1 5 10 15
 Pro His Ser

<210> 91
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> D3 primer used to desgin mutant Fbpl allelele

<400> 91
 cttccttatc taacagaaga tgga 24

<210> 92
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Fbpl wild-type D1 primer

<400> 92
 tcctgaccat cctctcgatg agc 23

<210> 93
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> neoR gene L90 primer

<400> 93

tctaattcca tcagaagctg act

23

<210> 94
<211> 4
<212> PRT
<213> Fbp1 binding domain

<400> 94
Asp Ser Gly Ser
1

<210> 95
<211> 12
<212> PRT
<213> Homo sapiens

<220>
<223> Ikappa Beta alpha substrate of Beta-Trcp1/Fbp1

<400> 95
Asp Arg His Asp Ser Gly Leu Asp Ser Met Lys Asp
1 5 10

<210> 96
<211> 12
<212> PRT
<213> Homo sapiens

<220>
<223> Beta-catenin substrate of Beta-Trcp1/Fbp1

<400> 96
Ser Tyr Leu Asp Ser Gly Ile His Ser Gly Ala Thr
1 5 10

<210> 97
<211> 12
<212> PRT
<213> Homo Sapiens

<220>
<223> Emil substrate of Beta-Trcp1/Fbp1

<400> 97
Leu Tyr Glu Asp Ser Gly Tyr Ser Ser Phe Ser Leu
1 5 10

<210> 98
<211> 12
<212> PRT
<213> Mus musculus

<220>
<223> Emil substrate of Beta-Trcp1/Fbp1

<400> 98

Leu Tyr Glu Asp Ser Gly Tyr Ser Ser Phe Thr Gln
1 5 10

<210> 99
<211> 12
<212> PRT
<213> *Xenopus laevis*

<220>
<223> Emil substrate of Beta-Trcp1/Fbp1

<400> 99
Ala Leu Gln Asp Ser Gly Tyr Ser Ser Leu Gln Asn
1 5 10

<210> 100
<211> 12
<212> PRT
<213> *Drosophila Melanogaster*

<220>
<223> Emil substrate of Beta-Trcp1/Fbp1

<400> 100
Ser Leu Met Asp Ser Gly Asn Ser Ser Ile His Leu
1 5 10